The potential emission of personal care products derived plastic microbeads: a case study of Ho Chi Minh City, Vietnam

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ABSTRACT: Plastic microbeads are commonly used in many personal care products and can cause adverse impacts to the environment and ecosystem. The toxicological problem with these pollutants are due to their non-biodegradable materials, which washed down the drain; end up accumulating in the aquatic system causing increased frequency and quantity of items ingested by biota. Several polymers (e.g. Polyethylene) especially those found in plastic microbeads have been reported to be in tandem with other toxic contaminants serving as a vector for their transports in the environment. Thus, the legislative ban for plastic microbeads is used in some developed countries, but many countries including Vietnam do not take any legal action. This present study aimed at potential microbead's existence in the cosmetic market of Ho Chi Minh City (HCMC). The list and ingredients of microbeads containing personal care products (toothpaste, facial cleanser/scrubs and body wash/scrubs) have been checked. The microbeads containing PCPs are common for all explored categories, especially in toothpaste. Data from the online questionnaire survey have shown that 98% of respondents have frequently used at least one microbead containing product. Four polymers (Polyethylene, Acrylates Copolymer Styrene/Acrylates Copolymer and Acrylates/C10-30 Alkyl Acrylate Crosspolymer) have been observed in the product package of several facial cleansers and body scrubs. Thus, the potential negative impacts of this contaminant should not be ignored.

Keywords: microplastics, microbeads, personal care product, pollution.

1. Introduction

The pollution caused by microplastics is of growing environmental concern [1]. Microplastics are defined as plastic items sized between 100 nm and 5 mm. Plastic microbeads, which are ingredients of personal care products (PCPs), have been considered as a significant primary source of microplastics in...
the environment. Microbeads were patented in 1972 [2] as an alternative to the inorganic (e.g. aluminum oxide) and/or natural materials (millet or pumice peels) in a wide range of PCPs such as (but not limited to) soap, shampoo, toothpaste, shaving cream, facial masks and children’s bubble bath [3,4]. Plastic ingredients are present in PCPs at different percentages, ranging from a fraction of a percent to more than 90% in some cases. Regarding the frequent usage, the Government of Canada listed 9 common and 11 possible plastic ingredients of PCPs [5]. Major functions of the microbeads were replaced for natural material as abrasive. Its other functions serve as bulking agent, viscosity regulators, film formers, aesthetic agent, and sorbent for delivery of active ingredients. It is noted that the mentioned above functions go beyond the well-known scrubbing effect of microbeads [6].

In the recent literature, PCPs that are categories as facial cleansers and scrubs are the most studied; others, such as toothpaste, and shower gel/body scrubs have received less attention. Actually, there is more to ‘microbeads’ than meets the eye – while some are large enough to be easily visible to the naked eye, other microbeads on the market for PCP’s formulations are as small as 1 μm. Others are even smaller than that (nano-particulates). The microbeads have been extracted from PCPs with filtration after being dissolved with ultra-pure/distilled water. The granular distribution of microbeads could be determined by a combination of different techniques namely microscopic, spectroscopic, utilizing the naked eye and instruments will help to recognize smaller microplastics [7]. Recently single particle inductively coupled plasma mass spectrometry (SP-ICP-MS) has proved to be a feasible methodology for the detection and size characterization of plastic microparticles. Laborda et al. [8] have used SP-ICP-MS to detect microbeads smaller after filtration through 10 μm pore size polycarbonate IsoporeTM membranes. Visual examination by optical microscopy is commonly used for detecting, sorting and counting microplastics over 50 μm [8]. In addition to that, another technique has been developed. For example, Fourier transform infrared (FT-IR) or Raman techniques in combination with optical microscopy (FT-IR and Raman microscopies) will allow for the detection of the chemical and morphological (size and shape) characterization and the number quantification of individual particles down to 10 and 1 μm [9]. The number of extracted microplastics particles from any media is dependent on filter size used in the extraction step so the concentrations of microbeads were relatively low as most their frequent equivalent diameter were 2 to 3 μm [8].

In the PCPs, microbeads have different colors such as white, transparent, opaque, blue, red, orange, etc. Despite the compound “bead” which refers to spherical particles, and the common belief that microbeads are the colored spherical microparticles that can be seen in toothpastes [10,11,12], microbeads are mostly of irregular shape to provide better abrasion [13,14]. In fact, the spherical colored beads are used mainly for decoration and not abrasion [15]. Almost all PCPs have more than one type of bead shape [11] and the addition of irregularly shaped microplastics provides larger specific surface areas and greater friction [16]. In addition, the irregular but typical bead shapes can be attributed to the production process: they are produced by ultrafine grinding in a mill [17].

Microbeads quantity showed wide variation in all of the PCP’s categories as standard deviation higher than mean values (Fig 1). Obviously, the higher average concentrations were found in the case of facial and body scrubs (129±571 items/mg) and (333±483 items/mg), respectively. Facial cleanser and shower gel contain significantly lower rates of microbeads (0.22±0.41 items/mg and 0.25±0.43 items/mg, respectively). The data of microbeads in toothpastes was scarce. The value of 1.18 g/mg has been reported with Bråte et al. [18]. The extremely high mean values of facial scrub (3.10x10^8 items/mL, [8]) could be explained by the different analytical methods.
Fig 1. Box-plot of concentration and size of plastic microbeads in PCPs (the detailed data are shown in Appendix B). Three groups have been divided based on the part of human body: (1): FC: Facial cleanser and FS: Facial scrub, (2): Shower gel and body scrub and (3) Toothpaste.

The usage of microbeads deriving PCPs has increased since early 2000s. Fendall and Sewell [10] estimated that every household was using at least one scrub containing microbeads, on a daily or at least on a weekly basis. Plastic microbeads are non-biodegradable materials, and can get washed down the drain and accumulate in receiving water bodies. The first publication that mentioned a threat to the environment due to microbeads released from PCPs was published by Zitko and Hanlon [19]. However at that time, this issue was not recognized globally, because of their seemingly low input into the marine environment at the time (0.2 t/yr for New Zealand) [20]. From households, microbeads are likely to be transported to wastewater treatment plants, where some will be captured in oxidation ponds or sewage sludge [10]. However, due to their small size, they will go straight through the treatment system [21] without getting trapped. Approximately 1.4% [22] to 5% [23] of microplastics are released into the environment after treatment. In developing countries, microbeads can be discharged directly into the receiving area without going through the wastewater treatment system. This significantly increases the amount of microbeads released into the environment. Recently, a much larger input has been noted in many regions and a growing body of study has focused on this emerging pollutant. It is estimated that more than 4,130 tons of microbeads were added to cosmetics in the EU market in 2012, including the Nordic countries [24] while Duis and Coors [25] estimated that 8 g of microplastics from cosmetics per capita per year.

Upon entering the aquatic system, plastic microbeads can be ingested by several organisms, often through the trophic chain [11,16]. The compiled data showed that more than 95% of PCP-derived plastic microbeads have diameter fewer than 350 μm so these could be easily digested by aquatic biota [16]. In addition, like other microplastic, microbeads can act as vectors for toxic pollutants (dioxin, PCBs, PAHs, heavy metals, etc.) and may pose risks to aquatic environments due to their very long presence in marine ecosystems and propensity to be ingested by biota [13,26].

In order to limit and reduce the amount of microbeads discharged into the aquatic ecosystem every year, a number of developed countries have enacted legislation banning the use/production of PCPs containing microbeads, which proves that microbeads will drop quickly in the future. Some countries have enacted laws to ban plastic microbeads in PCPs, such as the UK, USA, Thailand (Fig 2). However, there are still many other developing countries including Vietnam that are still expanding the market for PCPs and have not taken any strict legal action.
Fig 2. Regulations related with microbeads global.

This paper provides the updated information with regards to the current situation of PCPs deriving microbeads and the potential risks to residents in Ho Chi Minh city (HCMC). In addition to conclusive remarks, future directions on how to enhance community awareness as a priority measure to reduce microplastic contamination are also suggested.

2. Study area and methods

2.1. Study area

HCMC is an attractive city and located in the south-eastern region of Vietnam. According to the 2019 census, the City has a population of over 8.9 million within the city’s border and over 21 million within its metropolitan area. HCMC is the economic center of Vietnam and accounts for a large proportion of the economy of Vietnam. The tropical climate together with the rising living standards, have caused cosmetics to be incorporated into communities. Together with the capital city of Hanoi, 90-95% of the market for international personal care products is centered in these cities [27]. The average expense for skincare products in HCMC is higher than any region in Vietnam and estimated to be about 14 US per month. Up to 73% use skincare products once per week or more often [28]. Regularly-used skincare products are facial cleansers. The personal care sector of HCMC has strong growth of 7 percent a year on average. Especially, the rate of municipal wastewater treatment was only 21% of 1.5 million m³/day that 79% of domestic wastewater discharged directly into the surface water receiving in HCMC [29]. Therefore, HCMC has been selected for the present study.

2.2. Method

2.2.1. Market survey

HCMC is an attractive and expanding market for PCPs, which have been increasingly consumed by the last few decades. To meet the growing demand, a lot of PCPs are imported in addition to local shops. Many multinational companies in HCMC, (namely Proctor & Gamble, Unilever, Johnson & Johnson, etc.) are up against strong competition from local firms, such as Dalan, Myhao, etc (Appendix C). With the miracle effectiveness through extensive advertising by producers together with widespread distribution in the market, microbeads containing PCPs became ordinary in HCMC. A brief overview of the potential microbead’s existence in the cosmetic market of HCMC has been explored. Three
supermarkets (Lotte Mart, Coopmart, and Bachhoaxanh) in District 7 were twice visited, which are present in almost all HCMC. Due to the Covid 19 pandemic, the survey has been further conducted through the websites of these supermarkets and two other cosmetic shops in HCMC (Guardian and Hasaki). Firstly, beads containing products from four different categories (toothpaste, facial cleanser/scrubs, and body wash/scrubs) were explored. Then, the ingredients will be checked to determine if this product contains plastics or not. However, it is not easy to find out the ingredients of the PCPs since it was not available on the shop’s website except the websites from Bachhoaxanh supermarket, where all the ingredients of PCPs are shown.

2.2.2. Community awareness of microbeads in PCPs

Besides the legislative action, community awareness is important because it can increase their knowledge base to influence purchasing decision. Therefore, a quantitative analysis was carried out in the form of an online questionnaire. The survey period extended over five weeks from 12th May to 19th June 2021. The survey was performed with an online survey (Google Forms). The survey asked participants for their opinion about (1) beads/microbeads containing PCPs usage and (2) consumer product decisions. The consumer product decisions are based on the following hypothesis:

- H1. The customer chooses microbeads containing PCPs because of their effectiveness in comparison with other products;
- H2. The microbeads containing PCPs is the new trend of the cosmetic industry;
- H3. The natural ingredients in PCPs are important to make a decision of buying PCPs;
- H4. The usage of microbeads from PCPs could cause environmental pollution.

Five- level Likert scale, ranging from (0) Strongly disagree; (1) Disagree; (2) Fairy Agree; (3) Agree to (4) Strongly agree, has been used (Appendix B). A total of 200 respondents, between 18 to 40 years old, mainly students and officers, have participated in this survey (Table 1). The data from five respondents, who do not use any beads containing PCPs, are not further processed.

| Variable   | Number | Percentage (%) |
|------------|--------|----------------|
| Age (years)|        |                |
| 18–40      | 156    | 78             |
| >40        | 44     | 22             |
| Gender     |        |                |
| Male       | 118    | 59             |
| Female     | 82     | 41             |

2.2.3. Data processing

Statistical analysis has been performed with SPSS Version 11.0 statistical software package. The statistical reliability was first tested to assess the overall consistency of the psychometric questions. The Cronbach’s alpha coefficient was used to estimate the internal consistency of the Likert scale.

3. Results and discussions

3.1. The present situation of the beads containing PCPs in HCMC and the potential risks

It has been observed that it is not difficult to find microbeads containing PCPs in the supermarkets and/or shops of HCMC. The microbeads containing PCPs are common for all explored PCPs categories, especially in toothpaste (Table 2, Appendix C). The present study showed that 17 brands from 29 brands of toothpaste, 29 from 123 brands of facial cleansers/scrubs, and 30 from 426 brands body wash/shower gels, respectively, contain microbeads. The percentages of microbeads containing PCPs in each category could be arranged as follow: Toothpaste (58%) >Facial cleanser/scrubs (18%) >Body wash/Scrubs (6%).
However, for HCMC, not all PCPs list plastic in their ingredient list. In the case of toothpaste, none of the polymers are listed. In the case of facial cleansers and scrubs, 23% of microbeads containing products have listed polymers as Polyethylene, Acrylate Copolymer, and Acrylates/C10-30 Alkyl Acrylate Crosspolymer. For body wash and scrubs, the polymers including Polyethylene, Acrylate Copolymer, Styrene/Acrylates Copolymer, and Acrylates/C10-30 Alkyl Acrylate Crosspolymer have listed in 53% of microbeads containing products (Table 2).

Table 2. The microbeads containing PCPs in HCMC’s market.

| Categories            | Shop/supermarket                          | Number of microbeads containing products/ Total | Type and number of products of polymer                      |
|-----------------------|-------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|
| Toothpaste            | Coopmart, Lotte Mart, Bachhoaxanh          | 17/29                                         | 0                                                           |
| Facial cleanser/scrubs| Coopmart, Lotte Mart, Bachhoaxanh, Hakasi, Guardian | 29/123                                       | Polyethylene (3) Acrylates Copolymer (2) Acrylates/C10-30 Alkyl Acrylate Crosspolymer (7) |
| Body wash/scrubs      | Coopmart, Lotte Mart, Bachhoaxanh, Hasaki  | 30/426                                       | Polyethylene (2) Acrylates Copolymer (4); Styrene/Acrylates Copolymer (7) Acrylates/C10-30 Alkyl Acrylate Crosspolymer (4) |

This is not consistent with previous studies, which stated that plastic ingredients are present in all PCPs at different percentages, ranging from a fraction of a percent to more than 90% in some cases. According to physical characteristics, the plastic microbeads could be classified as thermoplastics e.g. Polyethylene, Polypropylene, Polystyrene, Polyamide, Polytetrafluoroethylene (Teflon), and thermoset plastics, e.g. Polyurethanes and certain Polyster. All thermoset plastics are solid-phase materials. Thermoplastics are also solid materials but they can be melted into liquids when they are heated to temperatures exceeding their melting point (or glass transition temperature). Since the melting points far exceed the temperatures in the marine environment, these plastics are considered solid too. Based on the polymer chain, the microbeads have defined homopolymers and copolymers. Homo-polymers are polymer chains of a single monomer type whereas copolymers are made by polymerizing different monomers in the same chain, either in random order, alternating monomers, or as ‘block’ copolymers (i.e. monomers clustered into blocks in the polymer chain of the copolymer molecule) [6].

More precisely, polyethylene has been found in 10.3% (3 products made in India and Thailand from 29 microbeads containing products) of facial cleanser/scrub, and 6.7% (2 products made in Malaysia from 30 microbeads containing products) of body wash/scrub (Appendix B). In comparison with previous studies, it can be seen that although microbeads containing PCPs are common in the HCMC market but Polyethylene was not always present in their ingredients. This is different from previous studies. For example, Godoy et al. [30] explored eleven supermarkets in the province of Granada (Spain) and found a higher percentage of products containing Polyethylene particles in ingredients as 50% (2 products; bath gel), 63% (12 products; body treatment), 27.5% (11 products: facial treatment) and 80% (4 products; foot treatment), respectively. Furthermore, Napper et al. [12] investigated six main brands of facial scrubs, based on the prevalence in major supermarkets close to Plymouth UK. The results have shown that all of the products listed in their ingredients contained Polyethylene [12]. According to
Fendall and Sewell [10], all four water-based facial cleansers were purchased at a supermarket in Auckland, New Zealand, were produced by major cosmetic manufacturers and containing Polyethylene in their ingredients. Similarly, Lei et al. [31] reported that based on the ingredient information on the packaging, Polyethylene was found in 7.1% (9 products from total 126 products) of facial cleansers, and 2.2% (3 products from total 136 products) of shower gels. Ustabashi et al. [32] has also mentioned that twenty percent of the toothpastes available in Turkey were found to contain Polyethylene at concentrations varying between 0.4 and 1%.

Although only a few names of plastics have been listed in the PCP’s sold in HCMC the potential impacts of microplastic could not be neglected. Previous studies have reported that polymers could be present in additional products regardless of whether they are included in the ingredient list. Habib et al. [14] have also noted that two products did not show an ingredients list, which breaches UAE law. However, it was found later that microplastics were isolated from both products.

As mentioned above, microbeads can contribute to the total microplastic load in the aquatic system. However, rarely are these micrometer-sized primary microplastics distinguishable from secondary microplastics when detected in an environmental matrix. The microbeads are not unique; it is not easy to distinguish by shape or other indicators. Other than plastic preproduction pellets and small plastic objects <5 mm that are still recognizable, the exact origins of the tiny microbeads in the aquatic system are untraceable [6].

As indicated in previous studies, microbeads could be littered into the environment via final effluent or biosolids (sewage sludge) from wastewater treatment plants (WWTPs) [33]. Previous studies showed that 95–99.9% of the microbeads may settle out into the sludge, leaving the remaining beads in the effluent [1]. For HCMC, the total volume of domestic wastewater (the major source of microbeads) is estimated to be 1.75 million cubic meters, and 1.3 million cubic meters are collected and treated in WWTPs every day [34]. The low density of microbeads in the effluent may not sound significant but assuming all WWTPs in HCMC operate at maximum capacity and that minimum density of microbeads are found (0.1 per L of effluent, [1]) so at least 130,000 microbeads per day are emitted into the aquatic system of HCMC.

Thus, because of the large volume in production and current end-of-life strategy, microbeads have the potential to be a source of many microplastic particles to aquatic habitats. Like other microplastics, they are ubiquitous and bioavailable for injection by marine organisms [6,15,35]. Hence, it is noted that the release of microbeads of a size suitable for ingestion by marine organisms without degradation and therefore became available. Microplastics can mix with plankton and sediments, causing suspended or detritivorous organisms to ingest them by accident, since they are not always able to distinguish them from food [36]. The danger increases when these small organisms are eaten by larger organisms such as birds, marine mammals, turtles, fishes, etc. which causes microplastics to be transferred along the food chain until they reach human beings [36,37]. Hence, the high sorptive capacity of toxic contaminants has also increased microbeads’ toxicity. In HCMC, besides Polyethylene, other abundant polymer types have been indicated in PCPs are Acrylates Copolymer, Styrene/Acrylates Copolymer, and Acrylates/C10-30 Alkyl Acrylate Crosspolymer. However, the toxicity of these polymers was not clear. Thus, the following research needs to explore toxicity when these polymers are released into the environment.

However, the environmental regulations and microbeads management practices in Vietnam are not well developed. Therefore, microbeads released from PCPs could impose an additional burden on the natural environment.

3.2. Community awareness of microbeads in PCPs and future actions

The usage of microbeads containing PCPs in HCMC has been obtained from a questionnaire survey. Since the beads/microbeads containing PCPs are easily found in shops and supermarkets, almost (98%) of the respondents have used at least one product. A list of beads/microbeads containing PCPs including facial cleansers (12 brands), toothpastes (3 brands), body scrubs (4 brands), and shower gel (1 brand), were identified by respondents. In fact, it was discovered the usage of microbeads containing PCPs was
32% (shower gel), 12.5% (facial cleanser), 12% (body scrub), and 92% (toothpaste) of respondents, respectively. There are no differences between gender for the beads containing PCPs’ usage, both sexes have increased their demands for quality personal care and cosmetics products which may directly introduce a large number of microplastics (Appendix A).

In statistical analysis, Cronbach’s alpha is commonly used to estimate the reliability of the Likert scale. The Cronbach’s alpha coefficients were 0.829, which is above 0.60, representing good reliability [38]. Thus, the Likert scales can be considered reliable. The data showed that the majority of consumers placed great importance on product effectiveness (“microbeads containing PCPs are better to use than others”) and were highly influenced by new trend of PCPs “microbeads containing PCPs represent a new trend in the cosmetic industry” (69% and 68% of total respondents, respectively). It is expected since most of the respondents are students, so they always keep up-to-date with a new trend of PCPs and therefore will follow to use beads containing PCPs. In addition, the producers always promote the effectiveness of microbeads containing PCPs as totally remove of dead skin cells, deeply embedded impurities but less irritation and damage to the skin (facial scrubs) and remove plaque and stains due to their abrasive action (toothpaste). This is similar to a survey carried out with UC Berkeley students, which showed that majority of students placed great importance on product effectiveness [39].

Furthermore, the respondents specified that they paid attention to natural materials of beads. However, a significant part of respondents (35% of total respondents) were not concerned with the potential negative impacts of beads/microbeads. It is contrary to what was with Malaysia’s customers. Praveena et al. 2018 indicated that 62.6% of the respondents acknowledged the very and extremely importance of taking into consideration the environmental impacts resulting from microplastics in personal care products [40].

Therefore, the present study indicated that even students, who belong to a young and dynamic generation of HCMC, do not care about the potential environmental pollution caused by microbeads containing PCPs. In order to reduce the emission of PCP’s microbeads, community awareness should be taken into account soon in HCMC. A greater sense of awareness among the general public is to inform the consumers about the negative impacts of microbeads. The campaigns coupled with hashtags such as “#banthebead” could begin in the University to generate awareness among students [39]. Furthermore, legislative action should also go into practice. For example, the consumer should be informed on whether a cosmetic product contains polymeric compounds from its packaging, as it is obligatory from the EU’s legislation [41]. Nevertheless, when a cosmetic product is intended for cleansing or abrasion and simultaneously contains a polymeric compound, like Polyethylene, which is indicated high on the INCI list (meaning large quantity), it can be concluded with great certainty that the compound is a microbead [41].

4. Conclusions
The term ‘microbeads’ is used to describe plastic particles present as ingredients in personal care products and have recently created an environmental threat to ecosystems. In several developed countries (e.g. USA, Canada, France) a legislative ban on plastic microbeads-based PCPs has been proven effective to protect environment. However, other countries including Vietnam, besides the extended market for PCPs, do not take any legal action.

This summary of some primary results related to the potential risks caused by microbeads-based PCPs in HCMC. Approximately 50% of respondents have frequently used facial cleansers and body scrubs, which contain plastic microbeads shown in the product package. Instead of Polyethylene, other plastics such as Acrylates Copolymer, and Styrene/Acrylates Copolymer are recent common polymers in PCP. Hence, it should be noted that although the plastic composition is not shown by the manufacturers, this does not mean that these PCPs are free of microplastics. On the other hand, it is also evident that consumers in HCMC have insufficient knowledge about the negative impacts of plastic microbeads. This fact suggests that source reduction through community awareness is the most efficient method to reducing plastic contamination in this city.
Acknowledgment
Research project granted by Ho Chi Minh City University for Natural Resources and Environment under project “Investigation of microplastic’s emission from households in Ho Chi Minh City”. The authors thank Ms. Faith Su for English editing.

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Appendix A. The results of statistical analysis.

A.1. T-Test for gender difference

| Group Statistics |
|------------------|
|                | gender | N   | Mean | Std. Deviation | Std. Error Mean |
| PCPs           | Female | 118 | 2.7966 | 1.59357       | 0.14670         |
|                | Male   | 82  | 3.4146 | 2.05451       | 0.22688         |

| Independent Samples Test |
|---------------------------|
| Levene's Test for Equality of Variances | t-test for Equality of Means |
| F     | Sig. | t     | df  | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |
| PCPs  | Equal variances assumed | 8.580 | 0.004 | -2.393 | 198 | 0.018 | -0.61802 | 0.25828 | -1.12736 | -0.10869 |
|       | Equal variances not assumed | -2.287 | 145.304 | 0.024 | 145.304 | 0.024 | -0.61802 | 0.27018 | -1.15201 | -0.08404 |

A.2. Reliability of Likert scale.

| Case Processing Summary |
|-------------------------|
| N | % |
| Cases | Valid | 195 | 100 |
| Excluded* | 0 | 0 |
| Total | 195 | 100 |

*a. Listwise deletion based on all variables in the procedure.*

| Reliability Statistics |
|------------------------|
| Cronbach's Alpha | N of Items |
| 0.829 | 4 |

| Item-Total Statistics |
|------------------------|
| Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Tot Total Correlation | Cronbach's Alpha if Item Deleted |
| H1 | 6.4872 | 8.932 | 0.722 | 0.753 |
| H2 | 6.4410 | 9.134 | 0.673 | 0.776 |
| H3 | 6.4410 | 9.145 | 0.710 | 0.760 |
| H4 | 6.2923 | 10.012 | 0.527 | 0.841 |

A.3. Frequencies.

| Statistics |
|------------|
| H1 | H2 | H3 | H4 |
| N | Valid | 195 | 195 | 195 | 195 |
| Missing | 0 | 0 | 0 | 0 |
| Mean | 2.07 | 2.11 | 2.11 | 2.26 |
| Median | 2.00 | 2.00 | 2.00 | 2.00 |
| Std. Deviation | 1.21 | 1.23 | 1.18 | 1.23 |

| Frequency Table |
|----------------|
| H1: The microbeads containing PCPs are better |
| Frequency | Percent | Valid Percent | Cumulative Percent |
| 0.00 | 24 | 12.3 | 12.3 |
| 1.00 | 38 | 19.5 | 31.8 |
| 2.00 | 61 | 31.3 | 63.1 |
| 3.00 | 45 | 23.1 | 86.2 |
| 4.00 | 27 | 13.8 | 100.0 |
| Total | 195 | 100.0 | 100.0 |
H2. The microbeads containing PCPs is the new trend of cosmetic industry

| Frequency | Valid | Percent | Valid Percent | Cumulative Percent |
|-----------|-------|---------|---------------|--------------------|
| 0.00      | 22    | 11.3    | 11.3          | 11.3               |
| 1.00      | 41    | 21.0    | 21.0          | 32.3               |
| 2.00      | 55    | 28.2    | 28.2          | 60.5               |
| 3.00      | 47    | 24.1    | 24.1          | 84.6               |
| 4.00      | 30    | 15.4    | 15.4          | 100.0              |
| Total     | 195   | 100.0   | 100.0         |                     |

H3. The natural ingredients in PCPs is important to make decision of buying PCPs

| Frequency | Valid | Percent | Valid Percent | Cumulative Percent |
|-----------|-------|---------|---------------|--------------------|
| 0.00      | 15    | 7.7     | 7.7           | 7.7                |
| 1.00      | 51    | 26.2    | 26.2          | 33.8               |
| 2.00      | 57    | 29.2    | 29.2          | 63.1               |
| 3.00      | 41    | 21.0    | 21.0          | 84.1               |
| 4.00      | 31    | 15.9    | 15.9          | 100.0              |
| Total     | 195   | 100.0   | 100.0         |                     |

H4. The usage of microbeads from PCPs could cause environmental pollution

| Frequency | Valid | Percent | Valid Percent | Cumulative Percent |
|-----------|-------|---------|---------------|--------------------|
| 0.00      | 21    | 10.8    | 10.8          | 10.8               |
| 1.00      | 28    | 14.4    | 14.4          | 25.1               |
| 2.00      | 63    | 32.3    | 32.3          | 57.4               |
| 3.00      | 45    | 23.1    | 23.1          | 80.5               |
| 4.00      | 38    | 19.5    | 19.5          | 100.0              |
| Total     | 195   | 100.0   | 100.0         |                     |
## Appendix B. Overview of plastic microbead’s characteristics.

| PCP category | Country of purchase | Sample Code | Concentration (items/mg product) | Size (μm) | Granular determination methods | Color | Shape | Plastics | Polymer determination methods | Reference |
|--------------|---------------------|-------------|----------------------------------|-----------|---------------------------------|-------|-------|----------|-------------------------------|------------|
| Facial cleanser | USA | 1 | 0.09* | 100 - 500 | 272 | Dissecting scope | N/A | Spherical | Polyethylene | N/A | [a] |
| | | 2 | 0.08* | 130 - 520 | 271 | | | | Polyethylene | | |
| | | 3 | 0.09* | 80 - 400 | 183 | | | | Polyethylene | | |
| | | 4 | 0.08* | 60 - 420 | 215 | | | | Polyethylene | | |
| | | 5 | 0.08* | 200 - 600 | 317 | | | | Polyethylene | | |
| | | 6 | 0.10* | 60 - 540 | 265 | | | | Polyethylene | | |
| | | 7 | 0.09* | 120 - 600 | 274 | | | | Polyethylene | | |
| | | 8 | 0.08* | 100 - 600 | 286 | | | | Polyethylene | | |
| | | 9 | 0.08* | 180 - 600 | 293 | | | | Polyethylene | | |
| | China | A | 7.15 x 10^-3 | 7 - 1020 | 315 | Dissecting scope | White, transparent | Irregular | Polyethylene | Raman FTIR | [b] |
| | | B | 12.64 x 10^-3 | N/A | 272 | | | | Polyethylene | | |
| | | C | 11.06 x 10^-3 | N/A | 200 | | | | Polyethylene | | |
| | | D | 6.84 x 10^-3 | N/A | 380 | | | | Polyethylene | | |
| | | E | 4.92 x 10^-7 | N/A | 366 | | | | Polyethylene | | |
| | | F | 3.73 x 10^-7 | N/A | 380 | | | | Polyethylene | | |
| | | G | 9.86 x 10^-7 | N/A | 255 | | | | Polyethylene | | |
| | New Zealand | A | N/A | 10 - 1075 | N/A | Microscope | Transparent (?) | Irregular (granular, ellipses, threads) | Polyethylene | FTIR | [c] |
| | | B | N/A | 53 - 848 | N/A | | | | Polyethylene | | |
| | | C | N/A | 4 - 1240 | N/A | | | | Polyethylene | | |
| | The UK | A | 1.89 x 10^4 | 8 - 56 | 164 | Laser particle sizer | White, pink | Smooth | Polyethylene (?) | FTIR | [f] |
| | | B | N/A | 10 - >2000 | N/A | | | | Polyethylene | | |
| | | C | 919 | N/A | 318 | | | | Polyethylene | | |
| PCP category | Country of purchase | Sample Code | μBs' concentration (items/mg product) | Size (μm) | Granular determination methods | Color | Shape | Plastics | Polymer determination methods | Reference |
|--------------|---------------------|-------------|---------------------------------------|-----------|-------------------------------|-------|-------|----------|-------------------------------|-----------|
|              |                     |             |                                       | Range     | Mean | Median |                     |           |                               |           |                      |
| D            | N/A                 | N/A         | 289                                   | 148       | 104  | N/A   | White, light blue,   | Smooth    | Wax                           | ATR-FTIR  | [a]                   |
| F            | 1.89 x 10^15        | N/A         | 293                                   | 148       | 104  | N/A   | White, dark blue     | Smooth    | LDPE                          | [c]       |                      |
| China        | A                   | 9.93        | 24 - 832                              | 126       | 96   | N/A   | Blue, Light blue,    | Spherical | LDPE                          | [f]       |                      |
| B            | 28.90               | 24 - 988    | 148                                   | 104       | 104  | N/A   | Blue, Colourless     | LDPE      | Polyethylene                 | [g]       |                      |
| C            | 34.24               | 24 - 517    | 111                                   | 104       | 104  | N/A   | Colourless, Orange   | LDPE      | Polyethylene                 | [g]       |                      |
| D            | 5.22                | 24 - 829    | 148                                   | 104       | 104  | N/A   | Colourless, Irregular, mainly granular | LDPE      | Polyethylene                 | [g]       |                      |
| E            | 12.36               | 24 - 620    | 161                                   | 167       | 167  | N/A   | Colourless, White    | Mainly spherical | Polyethylene PVC | [g]       |                      |
| F            | 14.42               | 24 - 485    | 85                                    | 72        | 72   | N/A   | Colourless, White    | LDPE      | Polyethylene                 | [g]       |                      |
| G            | 25.10               | 24 - 813    | 88                                    | 63        | 63   | N/A   | Colourless, Irregular, mainly granular | LDPE      | Polyethylene                 | [g]       |                      |
| H            | 50.39               | 24 - 440    | 92                                    | 76        | 76   | N/A   | Colourless, Irregular | LDPE      | Polyethylene                 | [g]       |                      |
| I            | 7.19                | 24 - 790    | 186                                   | 190       | 190  | N/A   | Colourless, Irregular | LDPE      | Polyethylene                 | [g]       |                      |
| Slovenia     | A                   | 3108        | 38                                    | 38        | 38   | N/A   | Colourless, Irregular | LDPE      | Polyethylene                 | FTIR [b]  |                      |
|              | C                   | 2185        | N/A                                   | 56        | 56   | N/A   | Colourless, Irregular | LDPE      | Polyethylene                 | [c]       |                      |
| China        | A                   | 9.91        | 360 - 945                            | 663       | 652  | N/A   | Blue, Colourless     | LDPE      | FTIR [f]                     | [f]       |                      |
| Spain        | A                   | 0.53        | 12 - 1588                            | 419       | 419  | N/A   | White, Colourless    | LDPE      | FTIR [f]                     | [f]       |                      |
|              | B                   | 3.73        | 12 - 1445                           | 264       | 264  | N/A   | White, Colourless    | LDPE      | FTIR [f]                     | [f]       |                      |
|              | C                   | 1.60        | 9 - 2188                            | 424       | 424  | N/A   | Colourless, White    | LDPE      | FTIR [f]                     | [f]       |                      |
| The UAE      | A2                  | 3.60        | 18 - 253                            | 107       | 107  | N/A   | Colourless, White    | LDPE      | FTIR [b]                     | [f]       |                      |
|              | A10                 | 0.53        | 15 - 128                            | 60        | 60   | N/A   | Colourless, White    | LDPE      | FTIR [b]                     | [f]       |                      |
|              | A12                 | 6.89        | 15 - 233                            | 76        | 76   | N/A   | White, Red           | LDPE      | FTIR [b]                     | [f]       |                      |
|              | A13                 | 0.25        | 16 - 274                            | 116       | 116  | N/A   | White, Red           | LDPE      | FTIR [b]                     | [f]       |                      |
|              | A16                 | 1.57        | 14 - 150                            | 54        | 54   | N/A   | Red, Spherical       | LDPE      | FTIR [b]                     | [f]       |                      |
|              | A17                 | 7.62        | 15 - 191                            | 60        | 60   | N/A   | White, Brown         | Granular | Polyacrylate copolymer | Polyethylene |                      |
|              | A18                 | 7.02        | 20 - 146                            | 87        | 87   | N/A   | White/Brown          | Granular | Polyethylene               | Polyethylene |                      |
|              | A23                 | 1.85        | 20 - 132                            | 63        | 63   | N/A   | Blue, Spherical      | Polyethylene |                      | Polyethylene |                      |
|              | A24                 | 0.90        | 20 - 185                            | 66        | 66   | N/A   | Blue, White          | Polyethylene |                      | Polyethylene |                      |
|              | A27                 | 1.30        | 15 - 204                            | 65        | 65   | N/A   | White                | Irregular | Polyethylene               | Polyethylene |                      |
| PCP category | Sample Code | μBs⁻ concentration (items/mg product) | Size (μm) | Granular determination methods | Color | Shape | Plastics | Polymer determination methods | Reference |
|--------------|-------------|---------------------------------------|-----------|--------------------------------|-------|--------|----------|-------------------------------|-----------|
| **Body scrub** | | | | | | | | | | |
| Slovenia | B | 853 | N/A | 71 | N/A | Scanning electron microscope | Irregular | Polyethylene | FTIR | [b] |
| | D | 625 | N/A | 96 | N/A | Microscope | Irregular | Polyethylene | | |
| | E | 1186 | N/A | 75 | N/A | Microscope | Irregular | Polyethylene | | |
| Spain | D | 0.12 | 10 - 2188 | 520 | N/A | Malvern Microscope | White | Polyethylene | FTIR | [i] |
| | E | 0.56 | 12 - 2188 | 465 | N/A | Microscope | White | Polyethylene | | |
| | F | 2.14 | 5 - 2188 | 400 | N/A | Microscope | White | Polyethylene | | |
| | G | 0.86 | 15 - 2188 | 551 | N/A | Microscope | White | Polyethylene | | |
| | H | 2.32 | 23 - 1260 | 406 | N/A | Microscope | White | Polyethylene | | |
| | J | 0.30 | 15 - 1260 | 409 | N/A | Microscope | White | Polyethylene | | |
| | J | 0.00 | 20 - 832 | 297 | N/A | Microscope | White | Polyethylene | | |
| **Shower gel** | | | | | | | | | | |
| China | H | 4.77 x 10⁻³ | 110 - 970 | 458 | N/A | Dissecting scope microscope | White, transparent | Polyethylene | Raman/FTIR | [b] |
| | I | 1.65 x 10⁻³ | N/A | 348 | N/A | Microscope | White, transparent | Polyethylene | | |
| | J | 1.27 x 10⁻³ | N/A | 461 | N/A | Microscope | White, transparent | Polyethylene | | |
| **Toothpaste** | | | | | | | | | | |
| Malaysia | G | 48.99 x 10⁻⁷ | 13 – 110 | N/A | N/A | Microscope couple microscope | Blue | Grandfat | LDPE | FTIR | [i] |
| Turkey | 2 | N/A | 4 - <20 | N/A | N/A | Microscope | Opaque | Polyethylene | FTIR | [m] |
| | 3 | N/A | 4 - <20 | N/A | N/A | Microscope | Opaque, transparent | Polyethylene | | |
| | 12 | N/A | 4 - <20 | N/A | N/A | Microscope | Opaque, transparent | Polyethylene | | |
| | 20 | N/A | 4 - <20 | N/A | N/A | Microscope | Opaque, transparent | Polyethylene | | |
| UK | 1 | 1.18¹ | 50 - 590 | 248 | N/A | Scanning electron microscope | Blue | Irregular | Polyethylene | FTIR | [b] |

(*): g/mL, (**) : particles/mL, LDPE: low-density polyethylene, N/A: not available, FTIR: Fourier-transform infrared spectroscopy

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Appendix C. The microbeads containing PCPs sold in Ho Chi Minh City, the plastic microbeads are shown in bold.

| Category                  | PCPs                                      | Price | Country | Use                                                                 | Ingredients                                                                                                                                                                                                                                                                                                                                 |
|---------------------------|-------------------------------------------|-------|---------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Facial cleanser/ scrub    | Himalaya herbs clear complexion whitening face scrub | 4.2$  | India   | Scrubbing away dead skin cells, blackheads, and deeply embedded impurities | H₂O, Stearic acid, Caprylic / Capric Triglyceric, Cetyl alcohol, Sorbitan Stearate & Sucrose Cocoate, Polyethylene, Prunus americana seed Powder, Carboner, Glyceryl stearate SE, Phenoxethanol, Perfume, Sodium Hydroxide, Benzyl alcohol, Methylchloroisothiazolinone & Methylisothiazolinone, Tocopheryl Acetate, Glycyrrhiza glabra root extract, Disodium EDTA, Vetiver indica bark extract, CI 14700. |
|                           | Himalaya herbs gentle exfoliating daily face scrub | 5.2$  | India   | Deep cleaning, removing dead skin cells                               | H₂O, Ammonium Lauryl Sulfate, Cocamidopropyl Betaine, Sodium Cocoyl Glutamate & Disodium Cocoyl Glutamate, Polyethylene, Aloe Barbadensis Leaf Extract, Glycerc, Acrylates/10-30 Alkyl Acrylate Crosspolymer, Citrus Medica Limonum Peel Extract, Melia Azadirachta Leaf Extract, Sodium Hydroxide, Perfume, Phenoxyethanol, Prunus Americana Seed Powder, Lens Esculenta Fruit Extract, Methylchloroisothiazolinone & Methylisothiazolinone, Camarnba (Copernica cerifera) Wax D & C Red No.30(C173360), Glycercin, Citric Acid, Disodium EDTA, Tocopheryl Acetate, Sodium Metabisulfite. |
|                           | ST.Ives energizing coconut & coffee scrub  | 5.4$  | USA     | Deep cleaning, whitening skin, removing dead skin cells               | Water (Aqua), Juglans Regia (Walnut) Shell Powder, Glycercin, Glycerol Stearate SE, Cetyl Alcohol, Cocamidopropyl Betaine, Sodium Lauryl Sulfoacetate, Cetyl Alcohol, Triethanolamine, Salicylic Acid, Cetyl Acetate, Bue (CI 42090) |
|                           | ST.Ives blackhead clearing green tea scrub  | 5.4$  | USA     | Unclogs pores and calms redness for bump-free skin                    | Salicylic Acid 2%, Juglans Regia (Walnut) Shell Powder, Glycercin, Glycerol Stearate SE, Glycerol, Zea Mais (Corn) Kernel Meal, Glyceryl Stearate, Cetyl Acetate, Prunus Armeniaca (Apricot) Fruit Extract. |
|                           | ST.Ives acne control apricot scrub         | 5.4$  | USA     | Reduce breakouts and make your skin glow                              | Water (Aqua), Juglans Regia (Walnut) Shell Powder, Glyceryl Stearate SE, Glycercin, Zea Mais (Corn) Kernel Meal, Glyceryl Stearate, Cetyl Acetate, Prunus Armeniaca (Apricot) Fruit Extract. |
|                           | E100 Curcuma Facial Cleanser with Massage   | 1.5$  | Vietnam | Peeling away dead-cells, bright and smooth skin                       | Polyethylene glycol, Sodium laurel ether sulfate, Cocamidopropylbetaine, Stearic acid, Methylparaben, Fragrance, Lauric acid, Ceteareth 20, Potassium Hydroxide, Curcuma extract, Sensidin DO, Glyceryl Monostearate, Titanium Dioxide, Phenoxyethanol, Butylcarbamate, Distilled Water. |
|                           | Oxy Perfect Wash                          | 3.2$  | Japan   | Perfect cool                                                          | Water, Glycerin, Palmitic Acid, Stearic Acid, Lauric Acid, Myristic Acid, Potassium Hydroxide, Butylene Glycol, Sorbitol, Cocamid Methyl Mea, Cocamidopropyl Betaine, Ethanol Glyceryl Stearate, Sea Water, Algae extract, Salvia Officinalis Leaf Extract, Isopropyl Alcohol, Disodium Phosphate, Hydroxypropyl Cellulose, Methoc, Propylene glycol, Polyaquaternium-7, BHT, Disodium EDTA, Phenoxyethanol, Methylparaben, Propylparaben, Fragrance. |
|                           | Oxy Deep Wash Scrub Formula                | 3.4$  | Japan   | Deep wash                                                             | Water, Palmitic Acid, Glycerin, Stearic Acid, Sorbitol, Lauric Acid, Myristic Acid, Potassium Hydroxide, Hydrated Silica, Cocamid Myethyl MEA, Cocamidopropyl Betaine, Ethanol, Glyceryl Stearate, Algae Extract, Salvia Officinalis (Sage) Leaf Extract, Salicylic Acid, Polyolactic Acid, Lactic Acid, Isopropyl Alcohol, Hydroxypropyl Cellulose, Polyaquaternium-7, Polyaquaternium-10 Stearate, Polyaquarctium-10 Mristate, Disodium EDTA, BHT, Citric Acid, Sodium Dihydroacetate, Fragrance. |
| Category                  | PCPs                              | Price  | Country | Use                      | Ingredients                                                                                                                                                                                                                                                                                                                                 |
|---------------------------|-----------------------------------|--------|---------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oxy Total Anti-Acne a,b   | 3.4$                              | Japan  | Extra strength for acne  | Water, Glycerin, Sodium Cocoyl Glycinate, Butyryl Glycol, Hydroxypropyl starch, Phosphate, Cocamidopropyl Betaine Stearate, Sodium Lauroyl Aspartate, Sodium Stearoyl Glutamate, Camellia Sinensis Leaf Powder, Isopropylmyristyl Alcohol, Salicylic Acid, Nicotinamide, Citric Acid, Cocoylate, Lauric Acid, Stearic Acid, PEG-32, Polyquaternium-7, Hydroxypropyl Methylcellulose, Polyquaternium-52, Sodium Dodecyl-40 Sulfate, Sorbic Acid, Charcoal Powder, Polyglyceryl-10, Polyglyceryl-10 Myristate, Polyglyceryl-10 Stearate, Methylparaben, Propylparaben, BHT, Disodium EDTA, Fragrance, Cl 19140, Cl 42090. |
| Men's Biore Oil Clear a,b | 2.8$                              | Japan  | Oil Clear |                          | Water, Glycerin, Palmitic Acid, Stearic Acid, Palmitic Acid, Laureth-6 Carboxylic Acid, Propylene Glycol, Myristic Acid, Sodium Hydroxide, Cellulose, Zea Mays (corn) starch, Sorbitol, Lauric Acid, PEG-150, Fragrance, Menthol, Magnesium Potassium Fluosilicate, Decyl Glucoside, Sodium MA/Vinyl Alcohol Copolymer, Disodium EDTA, Menthol, PEG-45M, Kaolin, Magnesium/Potassium/Silicon/Fluoride/Hydroxide/Oxide, Alcohol, BHT, Camellia Sinensis Leaf Extract, Arginine, Bentonite, Betaine, Cetylpyridinium Chloride, O-cymen-5-ol, Cl 11680, Cl 77120, Cl 77499. |
| Men's Biore Deep Action a,b | 2.8$                              | Japan  | Deep action - Blackhead |                          | Water, Glycerin, Palmitic Acid, Stearic Acid, Laureth-6 Carboxylic Acid, Myristic Acid, Sodium Hydroxide, Propylene Glycol, Cellulose, Zea Mays (corn) starch, Sorbitol, Lauric Acid, PEG-150, Magnesium Potassium Fluosilicate, Fragrance, Decyl Glucoside, Sodium MA/Vinyl alcohol Copolymer, Disodium EDTA, Menthol, PEG-45M, PEG-6, Magnesium/Potassium/Silicon/Fluoride/Hydroxide/Oxide, BHT, Cetylpyridinium Chloride, Arginine, Bentonite, Betaine, Octacosyl-5-ol, Cl 77499, Cl 77891. |
| Men's Biore Deep Action Cool a,b | 1.7$                            | Japan  | Deep action – Extra cool |                          | Water, Glycerin, Palmitic Acid, Stearic Acid, Laureth-6 Carboxylic Acid, Propylene Glycol, Myristic Acid, Sodium Hydroxide, Cellulose, Zea Mays (corn) starch, Sorbitol, Lauric Acid, PEG-150, Fragrance, Menthol, Magnesium Potassium Fluosilicate, Fragrance, Decyl Glucoside, Sodium MA/Vinyl Alcohol Copolymer, Disodium EDTA, Menthol, PEG-45M, PEG-6, Magnesium/Potassium/Silicon/Fluoride/Hydroxide/Oxide, BHT, Cetylpyridinium Chloride, Arginine, Bentonite, Betaine, Octacosyl-5-ol, Cl 11730, Cl 19140, Cl 42053, Cl 42090, Cl 77499. |
| Biore Mild & Smooth a,b   | 2.1$                              | Japan  | Mild & Smooth |                        | Water, Sorbitol, Myristic Acid, Laureth-4 Laureth-6 Carboxylic Acid, Lauric Acid, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Ethylhexylglycerin, Palmitic Acid, Fragrance (Parfum), Polyquaternium-39, Disodium EDTA, PEG-45M, BHT, Phenoxethanol, Methylparaben, Propylparaben, Cl 77891. |
| Himalaya Oil Clear Lemon Face Wash a,b | 5.2$                            | Indian | Lemon essence |                      | Water, Ammonium Lauryl sulfate, Citrus medica limonum fruit extract, Cocamidopropyl betaine, Sodium cocoyl glutamate, Cocamide propylbetaine, Sodium lauryl glucoside, Fragrance, Citric Acid, Sodium metabisulfite, Methylchloroisothiazolinone & Methylisothiazolinone, Disodium EDTA, Phenoxethanol, Hydrogenated Jojoba Oil, Acrylates/C10-30 Alkyl Acrylate Crosspolymer. |
| Neutrogena Deep Clean Blackhead Eliminating a,b | 5.6$                          | USA    | Deep Clean Blackhead Eliminating |                     | Water, Sodium Methylacrylate Taurate, Cocamidopropylbetaine, Polymethacrylate, Disodium Lauramidoacetate, Citric Acid, Lauryl Methyl Gluceth-10 Hydroxypropylimonium Chloride, Methyl Glueth-20, Acrylates/Ammoniacrylates/C10-30 Alkyl PEG-20 Bacoamin Copolymer, Acrylates Copolymer, PEG-7 Distearate, Glycol Stearate, Silicicy Acid, Sodium Laureth Sulfate, Fragrance, Neopentyl Glycol Dicaprylate/ Diacyan, Iron Oxide, Mica, Cl 73360, titanium Dioxide, Agar, Propylene Glycol, Methylchloroisothiazolinone, Methylisothiazolinone, Cedrus Atlantica Bark Extract. |
| Acnes Gel Control Oil a,b | 2.3$                              | Japan  | Control Oil |                        | Water, Sodium Laureth Sulfate, Glycerin, Sodium Cocoyl Glycinate, Potassium Laureth Phosphate, Potassium Cocoyl Glycinine, Acrylates Copolymer, Sorbitol, Nicotinamide, Sodium Chloride, Maltooligosyl Glucoside, PEG-200 Hydrogenated Glyceryl Palmitate, Potassium Cocoyl, Sodium Hyaluronate, Zinc PCA, Hydrogenated Starch Hydrolysate, PEG-7 Glyceryl Cocoate, Gera, Microcrystallina, Disodium EDTA, Dopomagens Glycyrrhizae, Cl 73360, titanium Dioxide, Agar, Propylene Glycol, Methylchloroisothiazolinone, Methylisothiazolinone, Cedrus Atlantica Bark Extract. |
| Category                 | PCPs                          | Price | Country | Use                                      | Ingredients                                                                                                                                                                                                                           |
|--------------------------|-------------------------------|-------|---------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Calliderm gommage        | apaísant a l'aloe vera        | 7.8$  | France  | Remove dead skin cells, deep cleaning,   | Isopropylmethylphenol (O-cymen-5-ol), Oxybenzone, Benzotriazolyl Dodecyl p-Cresol, Sodium Lactate, Lactic Acid, Fragrance, Propylparaben, Methylparaben.                                                                                      |
|                          |                               |       |         | whiten, and softening skin               |                                                                                                                                                                                                                                                                                                    |
| Vaseline men anti        | dullness face scrub           | 3.1$  | Indonesia| Deep cleaning, removing dead skin cells, | Myristic Acid, Glycerin, Water/Aqua, propylene glycol, Potassium Sorbate, Sodium Lactate, Lactic Acid, Decyl Glucoside, Glyceryl Stearate, Phenoxyethanol, Disodium EDTA, PEG-4.                                          |
|                          |                               |       |         | whiten, skin                            |                                                                                                                                                                                                                                                                                                    |
| Rosette gommage          |                               | 4.3$  | Japan   | Remove dead skin cells, rejuvenating and | Water (Parfum Water), Ethanol, Glycerin, Stearic Acid, Carbomer, Allantoin, Lactic Acid, Malic Acid, Green Tea Extract, Methylparaben.                                                                                                     |
|                          |                               |       |         | strengthening the skin healthy, moist-   |                                                                                                                                                                                                                                                                                                    |
|                          |                               |       |         |ening the skin healthy, moist-ure        |                                                                                                                                                                                                                                                                                                    |
| Rosette gommage          | moist                         | 4.3$  | Japan   | Remove dead skin cells, rejuvenating and  | Water, Glycerol, Squalane, propylene glycol, Ethanol, Carbomer, Allantoin, Lactate, Glucose, Acid, Citric Acid, Malic Acid, Methylparaben.                                                                                                 |
|                          |                               |       |         | strengthening the skin healthy, moist-   |                                                                                                                                                                                                                                                                                                    |
|                          |                               |       |         | ure balance, improve skin elasticity     |                                                                                                                                                                                                                                                                                                    |
| Calliderm gommage        | corpored a L'huile D'argan Bio| 7.8$  | France  | Remove dead skin cells, deep cleaning,   | Water, Kaolin, Glycerin, Cetearyl Alcohol, Bentonite, Potassium Sorbate, Silica, Sodium Hydroxide, Levalinic Acid, Sodium Levaline, CI 77289, Hydroxide Green.                                                                                 |
|                          |                               |       |         | whiten, and softening skin               |                                                                                                                                                                                                                                                                                                    |
| Moist Cream Cleanser     |                               | 19.1$ | Korean  | Deep cleaning, moisturizing.             | Water/Aqua, Limnanthes Alba (Meadowfoam) Seed Oil, Myristic Acid, Lauryl Hydroxysultaine, Lactic Acid, Potassium Hydroxide, Glycerin, Sodium Chloride, Stearic Acid, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Fragrance / Parfum, Polyquaternium-7, PEG-14m, Disodium EDTA, Helianthus Annuus (Sunflower) Seed Oil, Sodium Benzoate, Tocopherol, Silica, BHT. |
|                          |                               |       |         | Suitable for dry skin                    |                                                                                                                                                                                                                                                                                                    |
| Multi Deep-Clean         | Cleanser                       | 18.7$ | Korean  | Remove makeup, sunscreen.                 | Water/Aqua, Glycerin, Myristic Acid, Stearic Acid, PEG-32, Potassium Hydroxide, Palmitic Acid, Lactic Acid, Cocamidopropyl Betaine, Microcrystalline Cellulose, Glyceryl Stearate, PEG-100 Stearate, Fragrance / Parfum, Sodium Chloride, Disodium EDTA, Sodium Benzoate, Polycaprolactone, Propandiol, Lactic Acid, PEG-75, Rubus Idaeus (Raspberry) Fruit Extract, Vaccinium Angustifolium (Blueberry) Fruit Extract, Coffea Arabica (Coffee) Seed Extract, Lycium Chinese Fruit Extract, Sapindus Mukorossi Fruit Extract, Vacunciun Macrocarpon ( Cranberry) Fruit Extract, Fangaria Chiloensis (Strawberry) Fruit Extract, Rubus Chamaemorus Seed Extract, Papain, Phenoxyethanol, Capric Acid. |
| Soy Milk The Facial      | Foam                          | 4.6$  | Japan   | Cleaning. Removes dirt, sebum, and other | Water, Glycerin, Myristic acid, PEG-8, Stearic Acid, Potassium Hydroxide, Lauric Acid, Glycol Distearate, Palmitic Acid, Cocamide DEA, Cocamidopropyl Betaine, Lactobacillus/soy milk ferment, Filmtate Glyceryl Stearate, Glyceryl Stearate SE, Glycerol, Polyquaternium-7, Tetrasodium EDTA, methylparaben, Fragrance. |
|                          |                               |       |         | impurities from the skin. Moisturizing   |                                                                                                                                                                                                                                                                                                    |
| Category | PCPs | Place | Country | Use | Link |
|----------|------|-------|---------|-----|------|
| Himalaya Fresh Start Oil Clear Face Wash - Blueberry | 68 | India | | Remove excess oil, dirt and impurities. Deep cleaning | Ingredients: Aqua, Glycerin, Sodium Cocoyl Glycinate, Fragrance, Sodium Benzoate, Phenoxyethanol, Polysorbate 20, Microcrystalline Cellulose, Titanium Dioxide, Sodium Hydroxide, Salicylic Acid, Citric Acid, Disodium EDTA, Guar Hydroxypropyltrimonium Chloride, Sodium Metabisulfite, Benzophenone-4, PEG-45M, Emblica Officinalis Fruit Juice Powder, Cl 77491, Cl 77492, Cl 77499, Cl 74160. |
| Himalaya Fresh Start Oil Clear Face Wash - Peach | 25 | India | | Deep cleaning. Removes excess oil, dirt, and impurities. | Ingredients: PEG-7 Glyceryl Cocoate, Glycerin, Sodium Cocoyl Glycinate, Fragrance, Sodium Benzoate, Phenoxyethanol, Polysorbate 20, Microcrystalline Cellulose, Titanium Dioxide, Sodium Hydroxide, Salicylic Acid, Citric Acid, Disodium EDTA, Guar Hydroxypropyltrimonium Chloride, Sodium Metabisulfite, Benzophenone-4, PEG-45M, Emblica Officinalis Fruit Juice Powder, Cl 77491, Cl 77492, Cl 77499, Cl 74160. |
| La Roche Posay Ultra Fine Scrub Sensitive Skin (50ml) | 27 | France | | Purifies and stimulates new cell regeneration. Removes excess oil, dirt, and impurities. pH balance of the skin | Ingredients: Aqua / Water; Butylene Glycol; Glycerin; Hydroxyethylpiperazine Ethane Sulfonic Acid; Perlite; Ammonium Polyacryloyldimethyl Taurate; Sodium Hydroxide; Pumice; Poloxamer 184; Disodium EDTA; Caprylyl Glycol; Xanthan Gum; T-buty Alcohol; Polyquaternium-47; BHT; Sodium Benzoate; Phenoxyethanol; Myristium Bromide; Parfum/Fragrance. |
| Natureine Aqua Peel Moisture Peeling Gel 300ml | 28 | Japan | | Clean the skin and excess sebum, maintain bright skin. Moisturizing | Ingredients: Water, Glycerin, Dicocodimonium Chloride, Steartrimonium Bromide, Butylene Glycol, Lauryl Betaine, Isopropyl Alcohol, Phenethyl Alcohol, Sodium Hyaluronate, Squalane, Pectin, Royal Jelly Extract, Hydrolyzed Collagen, Tilia Cordata Flower Extract, Althaea Officinalis Root Extract, Arnica Montana Flower Extract, Paeonia Suffruticosa Root Extract, Equisetum Arvense Extract, Humulus Lupulus (Hops) Flower Extract, Pinus Sylvestris Cone Extract, Citrus Limon (Lemon) Fruit Extract, Ruscus Aculeatus Root Extract, Rose Flower Oil, Sucrose, Alcohol, Rosa. |
| Eucerin Pro Acne Scrub | 29 | Germany | | Removing dead skin cells, prevent acne, removes dirt and impurities. | Ingredients: Aqua, Cocamidopropyl Betaine, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Lactic Acid, Sodium Chloride. |
| Hazeline orange cherry body scrub | 30 | Vietnam | | Removing dead skin cells, promote skin regeneration, keeps skin soft and fresh | Ingredients: Water, Sodium Laureth Sulfate, Cocamidopropyl Betaine, Sodium Chloride, Disodium EDTA, Citric Acid, Titanium Dioxide, Tetrasodium EDTA, Hydrated Silica/Silica (and) Cl 74160, Methylchloroisothiazolinone, Methylisothiazolinone, Lactobacillus/Milk Solids/Glycine Soja (Soybean) Oil Ferment, Cyclodextrin, Niacinamide, Benzophenone-3. |
| Enchanteur white creamy body scrub | 31 | Vietnam | | Contains massage beads to remove aging skin cells, dead cells and dark spots. Accelerate new cell regeneration. | Ingredients: Water, Glycerin, Propylene Glycol, Glycerin, DMDM Hydantoin, Cetrimonium Chloride, Carbomer, Dipotassium Glycyrrhizate, Sodium Chloride, Tocopheryl Acetate, Aesculus Hippocastanum (Horse Chestnut) Extract, Tetrasodium EDTA, Disodium Phosphate, Tocopherol, Tetrasodium Pyrophosphate, Sodium Metabisulfite, Benzophenone-4. |
| AN'Sw lavender exfoliating gel | 32 | Vietnam | | Contains massage beads to remove aging skin cells, dead cells and dark spots. Accelerate new cell regeneration. | Ingredients: Water, Glycerin, Propylene Glycol, DMDM Hydantoin, Carbomer, Lauramide DEA, Disodium Glycyrrhizate, Sodium Chloride, Citric Acid, Disodium Phosphate, Tetrasodium EDTA, Tocopheryl Acetate, Aesculus Hippocastanum (Horse Chestnut) Extract, Tetrasodium Pyrophosphate, Sodium Metabisulfite, Benzophenone-4.
| Category | PCPs | Price | Country | Use | Ingredients |
|----------|------|-------|---------|-----|-------------|
| Olay daily exfoliating with sea salts | 6.5$ | USA | Body cleansing, moisturizing, exfoliating skin smooth bright | Water, Sodium Trideceth Sulfate, Petrolatum, Sodium Chloride, Cocamidopropyl Betaine, Trideceth-3, Fragrance, Parfum, Guar Hydroxypropyltrimonium Chloride, Sodium Benzoate, Xanthan Gum, Citric Acid, Stearyl Stearate, Glycerol Palmitate, Disodium EDTA, Sodium Hydroxide, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Euphorbia Cerifera (Candelilla Wax, Cire De Candelilla, Sea Salt, Sal Ce Mahi, Jojoba Esters, Methylchlooroisothiazolone, Methylisothiazolone, Ultramarines. | | 23 |
| Felina body scrub apricot kernel scrub calendula | 5$ | Vietnam | Removing dead skin cells. Moisturizing, whitening, and softening skin | Aqua, Prunus Armeniaca (Apricot) Kernel Powder, Triethanolamine, Sodium Laurate Sulfate, Cocamidopropyl Betaine, Glycerin, DMDM Hydantoin, Carbomer, Sodium Lactate, PEG-40 Hydrogenated Castor Oil, Tocopheryl Acetate, Calendula Officinalis Flower Extract, Prunus Armeniaca Kernel Oil, Paraffinum Liquidum, Parfum. | | 24 |
| Felina body scrub apricot kernel scrub avocado | 5$ | Vietnam | Removing dead skin cells. Moisturizing, whitening, and softening skin | Aqua, Prunus Armeniaca (Apricot) Kernel Powder, Triethanolamine, Sodium Laurate Sulfate, Cocamidopropyl Betaine, Glycerin, DMDM Hydantoin, Carbomer, Sodium Lactate, PEG-40 Hydrogenated Castor Oil, Tocopheryl Acetate, Persea Gratissima Fruit Extract, Butylene Glycol, Parfum. | | 25 |
| Veilment Spa Himalaya Pink salt | 12.1$ | Korea | Removing dead skin cells. Moisturizing, whitening, and softening skin | Aqua, Sodium Laurate Sulfate Glycerin, Acrylates Copolymer, Microcrystalline Cellulose, Fragrance, Lauryl Hydroxyethylcellulose, Cellulose Acetate, Cocamidopropyl Betaine, Alcohol Denat., Sodium Benzoate, Caprylyl Glycol, Potassium Hydroxide, Sea Salt, Hexylene Tetrasodium EDTA Rose Extract, Calendula Sinensis Leaf Extract, Buxus Tree (Fatsia) Leaf Extract, Butylene Glycol, 1,2-Butanediol, DMDM Hydantoin, Carbomer, Sodium Chloride, Citric Acid | | 26 |
| Veilment Spa Black rose | 12.1$ | Korea | Removing dead skin cells. Moisturizing, whitening, and softening skin | Aqua, Sodium Laurate Sulfate, Acrylates Copolymer, Microcrystalline Cellulose, Fragrance, Glycerin, Lauryl Hydroxyethylcellulose, Cellulose Acetate, Cocamidopropyl Betaine, Alcohol Denat., Sodium Benzoate, Caprylyl Glycol, Potassium Hydroxide, Sea Salt, Hexylene Glycol, Prunus Armeniaca Seed Powder, Tetrasodium EDTA Rose Extract, Camellia Sinensis Leaf Extract, Butylene Glycol, 1,2-Butanediol, DMDM Hydantoin, Carbomer, Sodium Chloride, Citric Acid, Panthenol, Caprylyl Glycol, Hexylene Glycol, Potassium Hydroxide, Prunus Armeniaca Seed Powder, Hexasodium EDTA, Serine, Butylene Glycol, 1,2-Butanediol, Citric Acid, Punica Granatum Seed Oil, Caprylic/Capric Triglyceride, Rose Flower Oil, C14-17 Alcohol, Caprylyl Glycol, Butylene Glycol, Allantoin, Citric Acid, Cananga Odorata Flower Oil, Lavandula Angustifolia Flowers, Salvia Officinalis Leaf Extract, Butylene Glycol, 1,2-Butanediol, Citric Acid, Rosa Damascena Flower Oil, Ceramide NP, Sodium Hyaluronate. | | 27 |
| Veilment Spa Jasmine | 12.1$ | Korea | Removing dead skin cells. Moisturizing, whitening, and softening skin | Water (Including Onsen-sui), Sodium Laurate Sulfate Glycerin, Acrylates Copolymer, Microcrystalline Cellulose, Fragrance, Glycerin, Lauryl Hydroxyethylcellulose, Cellulose Acetate, Cocamidopropyl Betaine, Alcohol Denat., Sodium Benzoate, Caprylyl Glycol, Potassium Hydroxide, Sea Salt, Hexylene Glycol, Prunus Armeniaca Seed Powder, Tetrasodium EDTA Rose Extract, Camellia Sinensis Leaf Extract, Butylene Glycol, 1,2-Butanediol, DMDM Hydantoin, Carbomer, Sodium Chloride, Citric Acid, Panthenol, Caprylyl Glycol, Hexylene Glycol, Potassium Hydroxide, Prunus Armeniaca Seed Powder, PEG-40 Hydrogenated Castor Oil, Tocopheryl Acetate, Potassium Cocoyl Glycinate, Benzoate, Alcohol Denat., Potassium Cocoyl Glycinate, Caprylic Capric Glyceride, Sodium Citrate, Prunus Armeniaca Seed Powder, PEG-40 Hydrogenated Castor Oil, Sea Salt, Potassium Hydroxide, EDTA Succinyl Chloride, Hexylene Glycol, Citric Acid. | | 28 |
| Veilment Spa Deadsea Salt | 12.1$ | Korea | Removing dead skin cells. Moisturizing, whitening, and softening skin | Aqua, Sodium Laurate Sulfate, Acrylates Copolymer, Glycerin, Lauryl Hydroxyethylcellulose, Microcrystalline Fragrance, Cellulose Acetate, Potassium Cocoyl Glyinate, Benzene, Alcohol Denat., Potassium Cocoyl Glycinate, Caprylic Capric Glyceride, Sodium Citrate, Prunus Armeniaca Seed Powder, PEG-40 Hydrogenated Castor Oil, Sea Salt, Potassium Hydroxide, EDTA Succinyl Chloride, Hexylene Glycol, Citric Acid. | | 29 |
| ST.ives radiant skin pink lemon & mandarin orange exfoliating body wash | 7.2$ | USA | Removing dead skin cells. Whitening skin | Water (Aqua), Sodium Laurate Sulfate, Acrylates Copolymer, Hydrated Silica, Cocamide MEA, Sodium Chloride, Citrus Medica Limonum (Lemon) Fruit Extract, Citrus Nobilis (Mandarin Orange) Peel Extract, Fragrance (Parfum), Glycerin, Citric Acid, Tetradsodium EDTA, PPG-9, Propylene Glycol, Methylchloroisothiazolone, Methylisothiazolone, Red 33 (CI 17200), Yellow 5 (CI 19140). | | 30 |
| Category                                  | PCPs                                                                 | Price | Country | Use                                                                                      | Ingredients                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Link |
|-------------------------------------------|----------------------------------------------------------------------|-------|---------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| St. Ives purifying sea salt & pacific kelp exfoliating body wash | ST.Ives purifying sea salt & pacific kelp exfoliating body wash | 7.2$  | USA     | Removing dead skin cells, cleaning, and softening skin                                   | Water (Aqua), Sodium Laureth Sulfate, Acrylates Copolymer, Sodium Chloride, Cocamide MEA, Hydrated Silica, Fragrance (Parfum), Glycerin, Citric Acid, Tetrasodium EDTA, PPG-9, Propylene Glycol, Methylchloroisothiazolinone, Methylisothiazolinone, Sea Salt, Macrocystis Pyrifera (Kelp) Extract, Yellow 5 (CI 19140), Titanium Dioxide (CI 77891).                                                                                                                                                                                                                                                                                                                                                                                   | 41   |
| Dove gentle exfoliating                   | Dove gentle exfoliating                                             | 7.1$  | Vietnam | Moisturizing, skin whitening                                                              | Water, Cocamidopropyl Betaine, Sodium Laureth Sulfate, Sodium Cocoyl Glycinate, Sodium Chloride, Glycerin, Perfume, Silica, Acrylates/C10-30 Alkyl Acrylate Copolymer, Sodium Lauryl Isethionate, Stearic Acid, PPG-9, Styrene/Acrylates Copolymer, Phenoxethanol, Lauric Acid, Sodium Hydroxide, BHT, Sodium Palmitate, Sodium Benzoate, Tetrasodium EDTA, Sodium Isethionate, Citric Acid, Coconut Acid.                                                                                                                                                                                                                                                   | 42   |
| A bonne moisturizing shower cream scrub tomato & aloe vera      | A bonne moisturizing shower cream scrub tomato & aloe vera         | 3.9$  | Thailand| Deep Cleaning, Whitening and softening skin                                              | Sodium Chloride, Aqua, Sodium Laureth Sulfate, Cocamide Da, Cocamidopropyl Betaine, Glycerin, Fragrance, Prunus Armeniaca (Apricot) Oil, Allantoin, Hydrogenated Milk Protein, Arborin, Niacinamide, Solanum Lycopersicum Fruit Extract, C115985, C142090.                                                                                                                                                                                                                                                               | 43   |
| A bonne whitening shower cream scrub tamarind & aloe vera        | A bonne whitening shower cream scrub tamarind & aloe vera          | 3.9$  | Thailand| Whitening, cleaning, and softening skin                                                   | Sodium Chloride, Aqua, Sodium Laureth Sul fate, Cocamide Da, Cocamidopropyl Betaine, Fragrance, Methyl, Prunus Armeniaca (Apricot) Oil, Allantoin, Tamarindus Indica Extract, Aloe Barbadensis Leaf Juice, Niacinamide, Arborin, Cl 15985.                                                                                                                                                                                                                                                    | 44   |
| L’affair shower scrub pH 5.5 Whitening  | L’affair shower scrub pH 5.5 Whitening                             | 9.3$  | Malaysia| Contains body massage beads to fade dark spots                                           | Aqua, Sodium Laureth Sulfate, Acrylates Copolymer, Cocamidopropyl Betaine, Polyethylene, Glycerin, Triethanolamine, Polyquaternium 7, Fragrance, Polyquaternium 39, Citric Acid, Sodium Chloride, Aloe Barbadensis Leaf Juice, Tetrasodium EDTA, Methyl chloro orthoazoilone & Methylisothiazolinone.                                                                                                                                                                                                                                                   | 45   |
| L’affair shower scrub beaute              | L’affair shower scrub beaute                                       | 9.6$  | Malaysia| Removing dead skin cells, Moisturizing, whitening, and softening skin                    | Aqua, Sodium Laureth Sulfate, Acrylates Copolymer, Polyethylene, Glycerin, Poly Quaternium 7, Polyquaternium 39, Fragrance, Triethanolamine, Citric Acid, Sodium Chloride, Monas Alba (mulberry), Leaf Extract, Tetrasodium EDTA, Methyl Chloro orthoazoilone & Methylisothiazolinone.                                                                                                                                                                                                                                                   | 46   |
| Okay Age Defying Vitamin E Body Wash      | Okay Age Defying Vitamin E Body Wash                               | 6.2$  | USA     | Containing Vitamin E helps prevent skin aging                                            | Sodium Trideceth Sul fate, Petrolatum, Cocamidopropyl Betaine, Niacinamide, Sodium Citrate, Guar Hydroxypropyltrimonium Chloride, Glyceryl, Acrylates/C10-30 Alkyl Acrylate Crosspolymer.                                                                                                                                                                                                                                                                                                                                                                                      | 47   |
| Okay Fresh Outlast White Strawberry & Mint Body Wash                | Okay Fresh Outlast White Strawberry & Mint Body Wash                | 5.7$  | USA     | Perfect cool                                                                           | Water, Sodium Laureth Sulfate Cocamidopropyl Betaine, Sodium Chloride, Fragrance, N chillamid, Panthenol, Sodium Dirate Oleosulionate Sou, Bematate Glynol Distearate Citric Acid, Distadela Methyldihloro orthoazoilone Methylnocheinolone Red 33 Yellow 5.                                                                                                                                                                                                                                                                                           | 48   |
| Okay Ultra Moisture Shea Butter Body Wash | Okay Ultra Moisture Shea Butter Body Wash                          | 5.4$  | USA     | Moistures and protects the skin against UV rays                                         | Sodium Trideceth Sul fate, Petrolatum, Cocamidopropyl Betaine, Niacinamide, Sodium Citrate, Guar Hydroxypropyltrimonium Chloride, Glyceryl, Acrylates/C10-30 Alkyl Acrylate Crosspolymer.                                                                                                                                                                                                                                                                                                                                                                                      | 49   |
| Okay Soothing Orchid & Black Current Body Wash                      | Okay Soothing Orchid & Black Current Body Wash                     | 5.8$  | USA     | Hydration and freshness                                                                  | Water, Sodium Laureth Sul fate, Cocamidopropyl Betaine, Sodium Chloride, Fragrance, N chillamid, Panthenol, Sodium Citrate, Sodium Xylitol, Sodium Benenate, Glynol Distearate, Citric Acid, Diodium EDTA, Methylchloroisothiazolinone, Methylisothiazolinone, Red 33, Blue 1.                                                                                                                                                                                                                                                  | 50   |
| Sea Salt & Bergamot Marine Softness Body Wash                         | Sea Salt & Bergamot Marine Softness Body Wash                     | 5.8$  | USA     | Moisturizing for soft and fresh skin, Balance skin and provide minerals, soften skin, retain | Glycerin, Lauric Acid, Sodium Methylurate, Sodium Benenate, Stearic Acid, Cocos Nucifera (Coconut) Oil, Citrus Aurantium Bergamia (Bergamot) Fruit Oil, Sea Salt.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 51   |
| Category | PCPs                      | Price | Country | Use                                                                 | Ingredients                                                                                                                                                                                                                                                                                                                                 |
|----------|---------------------------|-------|---------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | Jojoba Shower Gel<sup>14</sup> | 8.25  | Japan   | Moisturizing for soft, white and fresh skin preventing aging skin     | Sodium PPG-16/PEG-2 Laurylethyl Ether Sulfate, Acrylates Copolymer, Cocamidopropyl Betaine, Cocamide Dea, Sodium Chloride, Sodium Laureth Sulfate, Sodium Cocooyl Glycinate/PEG-7, Sodium Laurelosyl Sarcisinate, Sodium Laurimidopropinate, Sodium Hydroxide, Phenoxethanol, Disodium EDTA, Isomerized Jojoba Oil.                                                                 |
|          | Caresse Shower Lotion<sup>15</sup> Cotton Flower | 3.75  | Spain   | Gently cleanses and moisturizes the skin. Whitening and softening skin. Balance moisture and prevent skin dryness. Protect skin against harmful external factors | Cotton, Aqua (Water), Sodium Chloride, Cocamidopropyl Betaine, Parfum (Fragrance), Sodium Laurelosyl Sulfate, Triethanolamine, Carbomer, Glycerin, Styrene/Acrylates Copolymer, Magnesium Nitrate, Gossypium Herbaceum (Cotton) Seed Extract, Methylisothiazolinone, Sodium Benzoate, Potassium Sorbate, Benzy1 Salicylate, Coumarin, Geraniol, Hesyl Cinnamal, Linalool.|
|          | Caresse Shower Lotion<sup>15</sup> Sweet Almond Milk | 4.65  | Spain   | Gently cleanses and moisturizes the skin. Whitening and softening skin. Balance moisture and prevent skin dryness. Protect skin against harmful external factors | Aqua (Water), Sodium Laurelosyl Sulfate, Sodium Chloride, Cocamidopropyl Betaine, Parfum (Fragrance), Styrene/Acrylates Copolymer, Triethanolamine, Carbomer, Propylene Glycol, Magnesium Nitrate, Prunus Amygdalus Dulcis (Sweet Almond) Fruit Extract, Magnesium Chloride, Methylisothiazolinone, Methylisothiazolinone, Coumarin, Hexyl Cinnamal, Limonene.|
|          | Caresse Shower Lotion<sup>15</sup> Vanilla Flower | 3.75  | Spain   | Gently cleanses and moisturizes the skin. Whitening and softening skin. Balance moisture and prevent skin dryness. Protect skin against harmful external factors | Aqua (Water), Sodium Laurelosyl Sulfate, Sodium Chloride, Cocamidopropyl Betaine, Parfum (Fragrance), Glycerin, Laureth-3, Styrene/Acrylates Copolymer, Polyquaternium-7, Triethanolamine, Magnesium Nitrate, Prunus Amygdalus Dulcis (Sweet Almond) Oil, Propylene Glycol, Magnesium Chloride, Methylchloroisothiazolinone, Methylisothiazolinone, Coumarin, Hexyl Cinnamal, Limonene.|
|          | Caresse Shower Cream<sup>15</sup> Olive Milk | 6.50  | Spain   | Gently cleanses and moisturizes the skin. Whitening and softening skin. Balance moisture and prevent skin dryness. Protect skin against harmful external factors | Aqua (Water), Sodium Laurelosyl Sulfate, Sodium Chloride, Cocamidopropyl Betaine, Parfum (Fragrance), Laureth-3, Glycerin, Styrene/Acrylates Copolymer, Citric Acid, Polyquaternium-7, Magnesium Nitrate, Olea Europaea (Oliver) Leaf Extract, Magnesium Chloride, Olea Europaea (Oliver) Fruit Oil, Sodium Benzoate, Methylchloroisothiazolinone, Phenyleneglycol, PEG-60 Hydrogenated Castor Oil, Glyceroyl Stearate, Phenoxyethanol, Methylisothiazolinone, Potassium Sorbate, Rosmarinus Officinalis (Rosemary) Leaf Extract, Helianthus Annuus (Sunflower) Seed Oil, Alpha-Isomethyl Ionone, Butylphenyl Methylpropional, Citronellol, Hesyl Cinnamal, Limoine, Limool, Cl 19140 (FD&C Yellow No. 5), Cl 42090 (FD&C Blue No. 1).|
|          | Caresse Shower Cream<sup>15</sup> Roselle | 6.25  | Spain   | Gently cleanses and moisturizes the skin. Whitening and softening skin. Balance moisture and prevent skin dryness. Protect skin against harmful external factors | Aqua (Water), Sodium Laurelosyl Sulfate, Sodium Chloride, PEG-4 Rapeseedamide, Cocamidopropyl Betaine, Styrene/Acrylates Copolymer, PEG-7 Glycerlyl Cocoate, Parfum (Fragrance), Coco-Glucoside, Citric Acid, Polyquaternium-7, Magnesium Nitrate, Rose Moschata (Musk Rose) Seed Oil, Sodium Benzoate, Methylchloroisothiazolinone, Magnesium Chloride, Methylisothiazolin-one, Tocopherol, Alpha-Isomethyl Ionone.|
|          | Plaisir Shower Gel<sup>16</sup> Pink Pomegranate | 3.85  | Spain   | Gently cleanses and moisturizes the skin. Whitening and softening skin. Balance moisture and                        | Aqua, Sodium Laurelosyl Sulfate, Sodium Chloride, Parfum, Cocamidopropyl Betaine, Laureth-3, Citric Acid, Glycerin, Magnesium Nitrate, Magnesium Chloride, Methylchloroisothiazolinone, Punica Granatum Fruit Extract, |
| Category | PCPs | Price | Country | Use | Ingredients | Link |
|----------|------|-------|---------|-----|-------------|------|
| Prevent skin dryness. Protect skin against harmful external factors | Methylisothiazolinone, Sodium Benzoate, Potassium Sorbate, Butylphenyl Methylpropiol, Citronellol, Geraniol, Limonene, CI 16255, CI 60730. | 3.8$ | Spain | Prevent skin dryness, Protect skin against harmful external factors | Prevent skin dryness, Protect skin against harmful external factors | 59 |
| Gently cleanses and moisturizes the skin. Whitening and softening skin. Balance moisture and prevent skin dryness. Protect skin against harmful external factors | Aqua (Water), Sodium Laureth Sulfate, Cocamidopropyl Betaine, Sodium Chloride, Decyl Glucoside, Parfum (Fragrance), Laureth-3, PEG-40 Hydrogenated Castor Oil, Argania Spinosa Kernel Oil, Citric Acid, Polyquaternium-7, Magnesium Nitrate, Magnesium Chloride, Methylchloroisothiazolinone, Methylparaben, Methylisothiazolinone, Propylparaben, Butylphenyl Methylpropiol, CI 19140 (FD&C Yellow No.5), CI14700 (FD&C Red No. 4). | 59 |

**Toothpaste**

| Category | PCPs | Price | Country | Use | Ingredients | Link |
|----------|------|-------|---------|-----|-------------|------|
| Fresh Bamboo Charcoal | Water, Hydrated Silica, Sodium Lauryl Sulfate, Flavor, PEG-12, Tetrasodium Pyrophosphate, Celluose Gum, Cocamidopropyl Betaine, Sodium Saccharin, Sodium Fluoride, Hydroxypropyl Methylcellulose, Bambusa Vulgaris Shoot Extract, Charcoal Powder, CI 77891, CI 74260. | 1.4$ | USA | Bright white crystal | 60 |
| Fresh Minty Blush | Water, Sorbitol, Hydrated Silica, PEG-12, Sodium Lauryl Sulfate, Flavor, Sodium Saccharin, CelluloseGum, TrisodiumPhosphate. | 1.9$ | USA | Cool crystal | 61 |
| Fresh Green Tea | Water, Sorbitol, Hydrated Silica, Sodium Lauryl Sulfate, Flavor, CelluloseGum, Cocamidopropyl Betaine, Benzyl Alcohol, Sodium Saccharin, Hydroxypropyl Methylcellulose, Menthol, CI 47005, CI 74260. | 1.9$ | USA | Cool crystal | 62 |
| Fresh Thai Crystal | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, Flavor, Sodium Saccharin, Sodium Fluoride, Menthol, CI 74260. | 1.9$ | USA | Cool crystal | 63 |
| Clean bacteria - Fresh cool | Water, Sorbitol, Hydrated Silica, Tetrasodium Pyrophosphate, Flavour Polyethylene Glycol, Cocamidopropyl Betaine, Cellulose Gum, Sodium Benzoate, Sodium Saccharin. | 1.3$ | Vietnam | Clean bacteria – Fresh cool | 64 |
| Clean bacteria, fight gingivitis | Water, Sorbitol, Hydrated Silica, Calcium Carbonate, Sodium Lauryl Sulfate, Green Tea Flavour, Sodium Benzoate, Sodium Monohydro Phosphate, Polyethylene Glycol, Tetrasodium Pyrophosphate, Cellulose Gum, Xanthan Gum, Sodium Saccharin. | 1.3$ | Vietnam | Clean bacteria, fight gingivitis | 65 |
| Heat clearing- Fresh cool | Water, Sorbitol, Hydrated Silica, Sodium Lauryl Sulfate, Green Tea Flavor, Tetrasodium phosphate, Polyethylene Glycol, Cellulose Gum, Sodium Benzoate, Sodium Saccharin, Sodium Fluoride, Camellia sinensis (Green Tea) Leaf Extract, CI 74260. | 1.3$ | Vietnam | Heat clearing- Fresh cool | 66 |
| White attraction x2.5 | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, PEG-31, Flavors, Cellulose Gum, Sodium Fluoride, Sodium Saccharin, Propylene Glycol, Lactic acid, Charcoal Powder, Cocos Nucifera Fruit Extract, PEG-60 HydrogenatedCastor oil, Mica, CI 77891. | 3.7$ | Vietnam | White attraction x2.5 | 67 |
| Whiter teeth In 2 weeks | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, Flavor, PEG-12, Cellulose Gum, Tetrasodium Pyrophosphate, xanthan gum, Cocamidopropyl Betaine, Charcoal Powder. | 1.8$ | Vietnam | Whiter teeth In 2 weeks | 68 |
| Category                  | PCPs                      | Price | Country   | Use                          | Ingredients                                                                                                                                                                                                 |
|---------------------------|---------------------------|-------|-----------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Close up Mandarin Oil    | Herbal                    | 2$    | Vietnam   | Fresh attraction             | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, PEG-32, Flavor (Mandarin extract, Orange extract, Buchu extract, ...) Cellulose Gum, Sodium Fluoride, Sodium Saccharin, Zinc Sulfate, Synthetic Fluorphlogopite, Sodium Hydroxide, C1 42090, C1 77891. |
| Close up Minty            | a,b,c                     | 2$    | Vietnam   | White attraction x2.5        | Sorbitol, Water, Hydrated Silica, Kaolin, Sodium Lauryl Sulfate, Flavor (Mentha Arvensis Leaf Oil), Cellulose Gum, Sodium Fluoride, Sodium Saccharin, Mica, Bentonite, Camellia Sinensis Leaf Extract, C1 77891, C1 74260, C1 16035, C1 12400. |
| Close up Fire Freeze      | a,b,c                     | 1.4S  | Vietnam   | Extreme Cool                 | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, PEG-32, Flavor, Cellulose Gum, Sodium Fluoride, Sodium Saccharin, Zinc Sulfate, Sodium Hydroxide, Glycerin, C1 12490, C1 74160, C1 77019, C1 77510, C1 77891. |
| Close up Snow Crystal     | a,b,c                     | 1.1S  | Vietnam   | Icy white – Winter blast     | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, PEG-32, Flavor, Cellulose Gum, Sodium Saccharin, Sodium Fluoride, Perlite, Synthetic Fluorphlogopite, C1 77891, Menthol, C1 74160, C1 42090. |
| Close up Minty Deep Action| a,b,c                     | 1.5S  | Vietnam   | Fresh breath                 | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, Flavor, Cellulose Gum, Perlite, Sodium Fluoride, Sodium Saccharin, Synthetic Fluorphlogopite, C1 77891, C1 74260, C1 19140, C1 42090. |
| Close up Winter Fresh     | a,b,c                     | 1.4S  | Vietnam   | Ice fresh with Extra white power | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, PEG-32, Flavor, Cellulose Gum, Sodium Saccharin, Sodium Fluoride, Perlite, Synthetic Fluorphlogopite, C1 77891, Menthol, C1 74160, C1 42090. |
| Closeup White Attraction  | a,b,c                     | 1.3S  | Vietnam   | White attraction diamond     | Sorbitol, Water, Hydrated Silica, Sodium Lauryl Sulfate, PEG-32, Flavor, Cellulose Gum, Trisodium Phosphate, Mica, Sodium Fluoride, Sodium Saccharin, PVM/MA Copolymer, Glycerin, Lecithin, Phenylphenol, C1 74160, C1 77891. |
| Closeup Lemon & Sea Salt  | a,b,c, d, e               | 2$    | Vietnam   | Whiter teeth In 2weeks       | Water, Sorbitol, Hydrated Silica, PEG-32, Sodium Lauryl Sulfate, Flavor, Sodium Lauryl Sulfate, Flavor, Cellulose Gum, Sodium Fluoride, Sodium Saccharin, Mica, Sodium chloride, Citrus Limon Juice, C1 77891, C1 74260, C1 47005, C1 42090. |

a: CoopXtra/Coopmart; b: Lotte Mart; c: Bach Hoa Xanh; d: Hasaki; e: Guardian