INTRODUCTION

Tapti river basin is located at the foothills of Satpura ranges in Khandesh region of Maharashtra State. Around this river lot of small-scale industries like sugar, chemicals, thermal power, dairies, pulp and paper have been grown up. The effluents from these industries are being ponded to this river are being contaminated\(^1\) by organic and metallic moieties.

The presence of minerals in soils and sediments is a result of both inheritance and authigenic formation of minerals. Several comprehensive reviews on the soil clay mineralogy\(^2-7\) in the past indicate the there are not many examples that can claim to show how far mineralogy has proven or likely influence in soil genesis and management. A search for links between mineralogy and soil properties of agricultural importance is likely to be difficult because many time the description of minerals actually present in a soil is inadequate or incomplete\(^8\). Soil minerals differ from "type" mineral and thus it is necessary to investigate the properties of these minerals in view of the properties of the soil in bulk. In this endeavour a few examples from the data set held by the National Bureau of Soil Survey and ‘Land Use Planning’ and that follows will indicate that despite soil clays being a mixture of several components, adequate description can be obtained if sustained efforts are made.

X-ray diffraction is the best technique for the identification and quantification of all the minerals present in the sediments and ricks. Engineering and industrial applications of rocks that contain clay minerals. This technique permits\(^9\) reproducible and accurate calculation of the mineral content families. Fe rich chlorides + berthierine, Mg rich chlorides, Fe rich dioctahedral 2:1 clay and micas, Al rich octahedral 2:1 clays micas and kaolinites.

This study presents the XRD, SEM, some physico-chemical and metallic status of sediments and the interpretation of clay minerals in Tapti river basin sediments.

EXPERIMENTAL

Sampling sites

Top soil profile samples were collected from Tapti river basin at Chopra, Maharashtra and brought to the laboratory. Samples were airdried, grind, sieved through > 2µm and stored in plastic bottles.
Sample Preparation

50.0 gm of fine powered sediment sample was taken in 1 litter measuring cylinder and add 1 litter of distilled water through mechanical shaking for 30 min. Keep this measuring cylinder over night and next day supernatant liquid was decanted with the help of a into a plastic bottle. The separated clay samples slide for X-ray differaction analysis was prepared by ollowing the Millipore filter transfer method.

Instrumental

X-ray diffractometer with a Cu Ka radiation tube was used. Scanning electron microscope equipped with an energy dispersive analysis system was used for SEM analysis.

RESULTS AND DISCUSSIONS

The results thus obtained during the course of present study are given in Tables - 1 & 2 and XRD diffractogram and SEM analysis are being presented in the Figs. 1-4.

X-ray Diffraction

The XRD results indicate that the main constituents of the clay samples are quartz, Kaolinite and little of the smective minerals are present. The scans of the clay extract from all the samples are more orless similar and shown in Fig. 1 and 2. All the scan show a broad quartz peak centered from 3.3-3.5 Å a sharpen asymmetric peak at about 7.16 Å and a slightly asymmetric peak at 5.9-7.1 Å. asymmetry of the peak results froma combinationof changingLP factor and the much more symmetric peak with its maximum range of a scanning from 7.16-14.4 Å are observed. The quartz 20-10 % in the interstratified face by comparing the integrated peak intensities to calculated profiles was possible to estimate the proportion of each clay type. Therefore, XRD is one of the most versatile techniques for the materials characterization.

Scanning Electron Microscopy (SEM)

The SEM can be used for high resolution imaging of the surfaces with a large depth of field. We have scanned two sediment samples for scan electron microscopy analysis.the arrangement of partical size average of the obtained liquid face was investigated by SEM. Figs. - 3 and 4 show the microscopy of typical clay particle size from the top soil profiles. These are different spacing in the same crystal confirming the presence of interstratified clays. SEM photographs clearly show the presence of quartz, kaolinite and little smectite minerals. These results also demonstrate the goodness of the particle size separation methods (clay-size fraction).

Table -1 : General characteristics and minerals observed by XRD and SEM analysis

| S. No. | Characteristic observed | No. of Sediments samples |
|-------|------------------------|-------------------------|
| 1     | Mineral in XRD analysis| Quartz                  |
| 2     | SEM                    | Supported same minerals |
| 3     | pH                     | 8.60                    |
| 4     | EC (µmhos/cm)          | 280                     |
| 5     | OM                     | 3017                    |
| 6     | COD                    | 185                     |

| No. of Sediments samples | 1 | 2 |
|--------------------------|---|---|
| Quartz                   |  |   |
| Kaolinite                |  |   |
| Little Smectite          |  |   |
| Supports same minerals   |  |   |
| 8.70                     |  |   |
| 590                      |  |   |
| 2241                     |  |   |
| 210                      |  |   |

Table - 2 : Metals (µg/g) in sediment samples

| S. No. | Metals | No. of Sediments samples |
|-------|--------|--------------------------|
| 1     | Cu     | 0.96                      |
| 2     | Zn     | 9.43                      |
| 3     | Cd     | 0.20                      |
| 4     | Pb     | 0.30                      |
| 5     | As     | ND                        |
| 6     | Hg     | ND                        |
| 7     | Ni     | ND                        |
| 8     | Cr     | 2.92                      |
| 1     |       | 1.0                       |
| 2     |       | 61.0                      |
| 3     |       | 0.26                      |
| 4     |       | 2.74                      |
| 5     |       | ND                        |
| 6     |       | ND                        |
| 7     |       | ND                        |
| 8     |       | 6.08                      |

kaolinite peak was observed at 5.9-7.1 Å. asymmetry of the peak results froma combinationof changingLP factor and the much more symmetric peak with its maximum range of a scanning from 7.16-14.4 Å are observed. The quartz 20-10 % in the interstratified face by...
Fig. - 1: Representative XRD diagram of the > 2µm fraction Tapti river basin sediment, top horizon, Depth 0-20 cm

Fig. - 2: Representative XRD diagram of the > 2µm fraction of another Tapti river basin sediment, top horizon, Depth 0-20 cm
The physico-chemical and metallic results of same samples have also been carried out and presented in Table - 2. these results clearly indicate the richness of organic and metallic moieties in these sediments.\textsuperscript{12-13}

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Boteti River, Botswana, at Samedupe Drift. (B) Close-up of a partially silicified non-pedogenic calcrete beneath the oor of Kang Pan, near Kang, Botswana. (C) Sheet-like pan/lacustrine silcrete developed through the desiccation of formerly eating colonies of the silica-xing cyanobacteria Chloriexus at Sua Pan, Botswana. 13.2 Diffractograms comparing XRD analysis from glass slide and membrane mounted samples of the same weathered granite from Meniet (central Algeria). 394 395. 397 403. Sediment Analysis of Some Physico-
chemical. Parameters of River Chambal near National Chambal. Sanctuary Region. Â Sedimentation is a natural process of any stream which provides sound ecological places for diverse organisms with quality food resources containing all necessary elements. Sediment is also an important ideal consanguineous habitat for underwater life (Marathe et al., 2011). Rivers exhibiting naturally (downstream of lakes) or anthropogenically reduced sediment supply are â€œsupply-limitedâ€ rivers (Montgomery and Buffington 1997). Limited supply leads to continuous armoring of bed surface sediments, a process occurring during ordinary flood events and without extraordinary floods (Fig. Â The â€œexcessâ€ sediments generated in extreme events often raise the issue of fine sediments for analysis and/or management of river ecology. In general, in river morphology (Evans and Wilcox 2014) and fish habitat studies (e.g., Pulg et al. 2013), fine sediments are classified as particles <1 mm. XRD and SEM Analysis of Tapti River Sediment: A Case Study. R. B. Marathe. Environmental Science. 2012. During the present investigation the sediments of the Tapti River have been analyse by the XRD and SEM techniques. In this investigation the minerals found are Quartz, Kaolinites, Calcite,… Expand. Â The concentration and distribution of selected trac e metals in surface sediment of the Tapti river at different station were studied .The analysis of bulk sediments shows that the concentration ofâ€}