Table S1 - Statistical analysis of TiO$_2$ embryotoxic risk at different developmental traits of zebrafish. Abbreviations stand for: h$_{pf}$ - hours post-fertilization; NOAEL - highest concentration at which there was not registered a statistically relevant toxic or adverse effect. Test range of TiO$_2$ pristine material and thermo-treated nanoparticles: 0-100 mg.L$^{-1}$. Test range of TiO$_2$ released at catalyst reuse: 0-4.25 mg.L$^{-1}$.

| h$_{pf}$ | Indep. variables | Analysis | TiO$_2$ pristine material | NOAEL | TiO$_2$ thermo-treated | NOAEL | TiO$_2$ released (reuse) | NOAEL |
|---------|------------------|----------|---------------------------|-------|------------------------|-------|-------------------------|-------|
| 8       | epipolic arc     | one-way ANOVA | $F(5,111)=2.199; P=0.060$ | 100 mg.L$^{-1}$ | $F(5,109)=3.758; P<0.050$ | 0.1 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 8       | yolk volume      | ANCOVA   | $F(5,107)=2.250; P=0.055$ | 100 mg.L$^{-1}$ | $F(5,73)=7.845; P<0.050$ | 10 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 32      | head-trunk angle | one-way ANOVA | $F(4,74)=0.722; P=0.580$ | 100 mg.L$^{-1}$ | $F(5,96)=7.845; P<0.050$ | 10 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 56      | pupil surface    | one-way ANOVA | $F(4,73)=7.177; P<0.050$ | 0 mg.L$^{-1}$ | $F(4,86)=11.550; P<0.050$ | 0.01 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 56      | yolk extension   | ANCOVA   | $F(5,54)=1.720; P=0.146$ | 100 mg.L$^{-1}$ | $F(5,46)=15.346; P<0.050$ | 1 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 0 mg.L$^{-1}$ |
| 56      | total body length| one-way ANOVA | $F(5,55)=2.268; P=0.060$ | 100 mg.L$^{-1}$ | $F(5,83)=2.711; P<0.050$ | 0 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 0 mg.L$^{-1}$ |
| 32      | spontaneous movements | one-way ANOVA | $F(5,24)=5.952; P<0.050$ | 0.01 mg.L$^{-1}$ | $F(5,24)=6.447; P<0.050$ | 10 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 32      | heart rate       | factorial ANOVA | $F(5,108)=30.821; P<0.050$ | 0 mg.L$^{-1}$ | $F(5,108)=3.334; P<0.050$ | 10 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 56      | heart rate       | one-way ANOVA | $F(5,18)=1.776; P=0.169$ | 100 mg.L$^{-1}$ | $F(5,18)=1.000; P=0.446$ | 100 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 56      | hatching rate    | chi-square test | $\chi^2=5.825; DF=5; P=0.324$ | 100 mg.L$^{-1}$ | $\chi^2=6.529; DF=5; P=0.158$ | 100 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 80      | burst swimming   | one-way ANOVA | $F(5,18)=1.776; P=0.169$ | 100 mg.L$^{-1}$ | $F(5,18)=1.000; P=0.446$ | 100 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
| 80      | survival         | chi-square test | $\chi^2=5.740; DF=5; P=0.332$ | 100 mg.L$^{-1}$ | $\chi^2=1.817; DF=5; P=0.874$ | 100 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ | 4.25 mg.L$^{-1}$ |
Table S2. Particles Characterization

|          | Pristine       | Heat-Treated  |
|----------|----------------|---------------|
| Dry      | TEM Dp (nm)    | 20 ± 5        | 38 ± 6        |
|          | DLS Dp (nm)    | 27.03         | 37.43         |
| Mili-Q Water | ZP (mV)     | -24.17 ± 0.04 | 20.77 ± 0.51  |
|          | pH             | 7.29          | 7.28          |
| Freshwater | DLS Dp (nm)  | 629.43        | 580.87        |
|          | ZP (mV)       | -6.47 ± 0.50  | -1.12 ± 0.51  |
|          | pH            | 7.30          | 7.70          |

Figure S1. Effective TiO₂ A- pristine nanoparticles, B- heat-treated nanoparticles size by Transmission Scanning Microscopy (TEM).