

Natural Clay Modified with ZnO/TiO₂ to Enhance Pollutant Removal from Water

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1. Nitrogen adsorption-desorption isotherms

The adsorption-desorption isotherms are represented in Figure S1 for pure TiO₂ and pure ZnO samples and in Figure S2 for Clay/Cu²⁺, Clay/TiO₂/Cu²⁺, Clay/ZnO/Cu²⁺ and Clay/ZnO samples. As explained in section 2.2, two types of isotherms are clearly observed: (i) type I isotherm (microporous solid) for pure TiO₂ and Clay/TiO₂/Cu²⁺ samples; and (ii) type IV isotherm (mesoporous sample) for pure ZnO, Clay/Cu²⁺, Clay/ZnO/Cu²⁺ and Clay/ZnO samples.

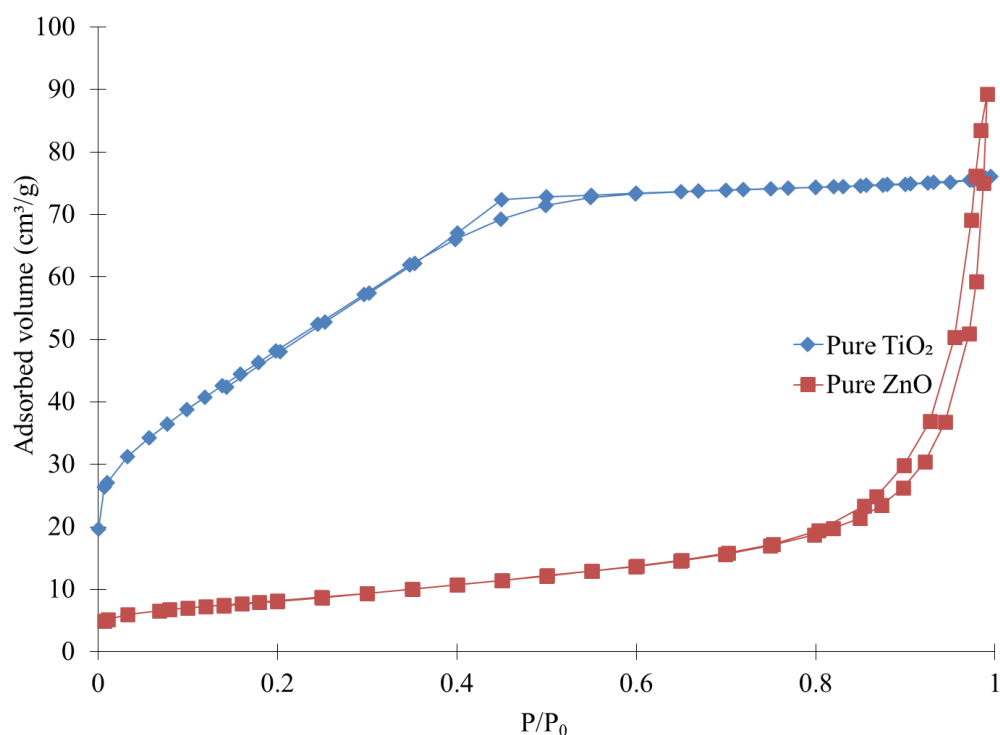


Figure S1. Nitrogen adsorption-desorption isotherms for (◆) pure TiO₂ and (■) pure ZnO samples.

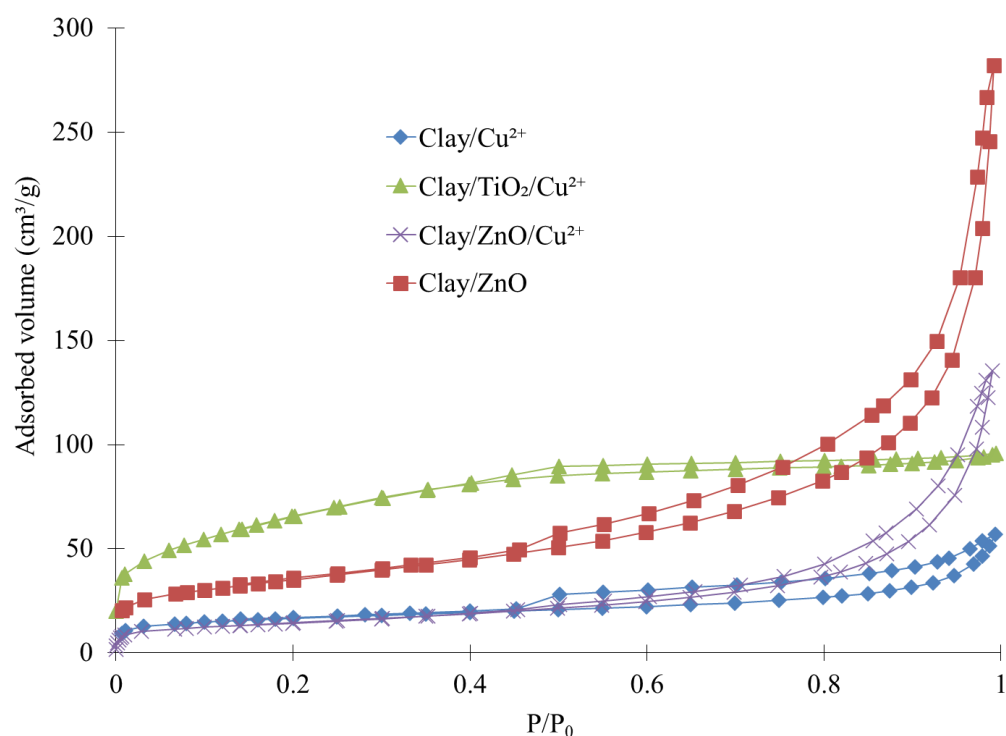


Figure S2. Nitrogen adsorption-desorption isotherms for (◆) Clay/Cu²⁺, (▲) Clay/TiO₂/Cu²⁺, (×) Clay/ZnO/Cu²⁺ and (■) Clay/ZnO samples.

2. SEM pictures

The samples with Cu²⁺ (Clay/Cu²⁺, Clay/TiO₂/Cu²⁺ and Clay/ZnO/Cu²⁺) keep similar aspect as without it (Figure 4) and are represented in Figure S3.

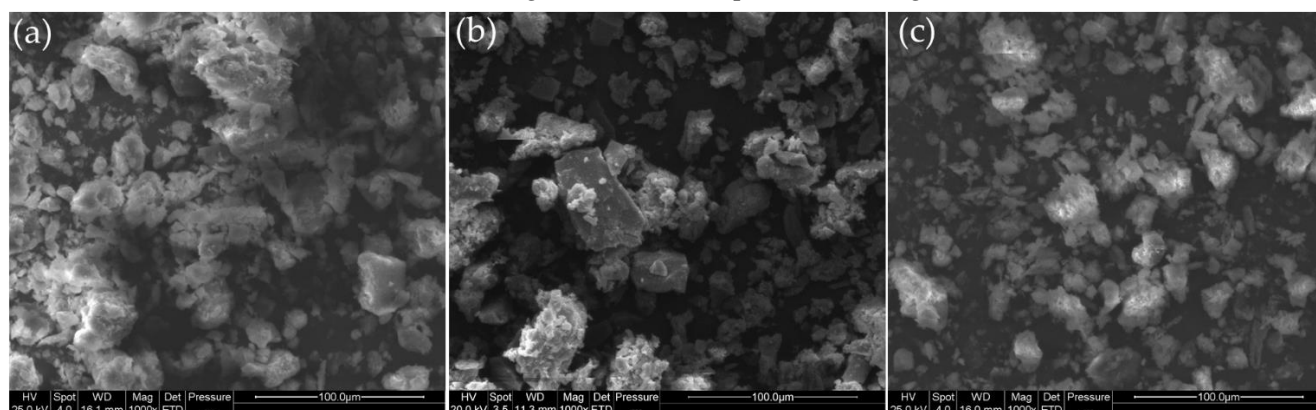


Figure S3. SEM pictures of (a) Clay/Cu²⁺, (b) Clay/TiO₂/Cu²⁺ and (c) Clay/ZnO/Cu²⁺ samples at a 1000x magnification.

3. UV/visible spectra of the model pollutants

Figure S4 represents the FL UV/visible spectrum recorded for the initial FL solution (6×10^{-5} M). After adsorption 6 h with bare Clay sample, the spectrum intensity decreases as shown on the Figure S4. The maximum peak is at 485 nm [1].

Figure S5 represents the PNP UV/visible spectrum recorded for the initial PNP solution (10^{-4} M) and the spectrum after 8 h in photocatalytic experiment with Clay/TiO₂ sample. The decrease of the maximum peak is well observed after photocatalysis. The maximum peak is located at 317 nm [2–4].

During the adsorption test, the spectrum stays identical as the initial PNP spectrum (●) in Figure S5 as no adsorption occurs.

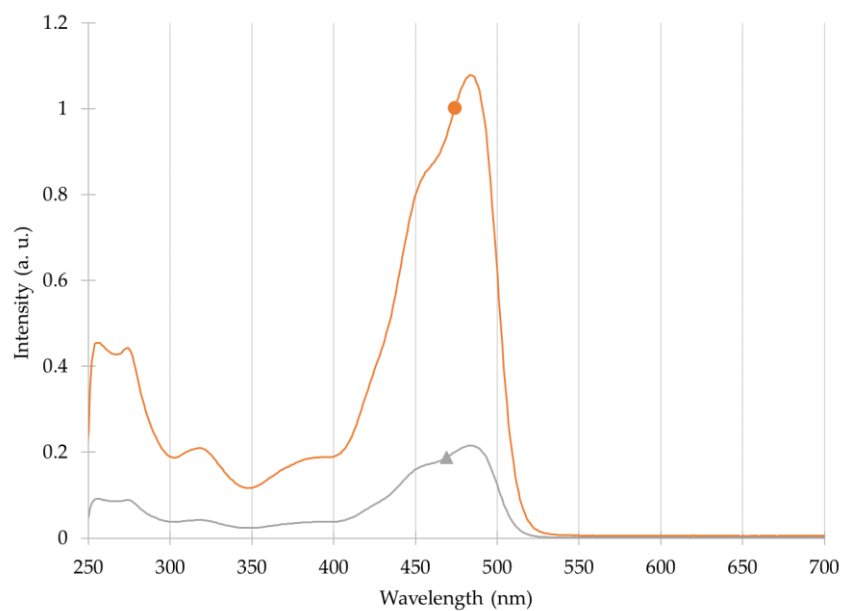


Figure S4. FL UV/visible spectrum for (●) initial FL solution and (▲) after 6 h in adsorption experiment with bare Clay sample.

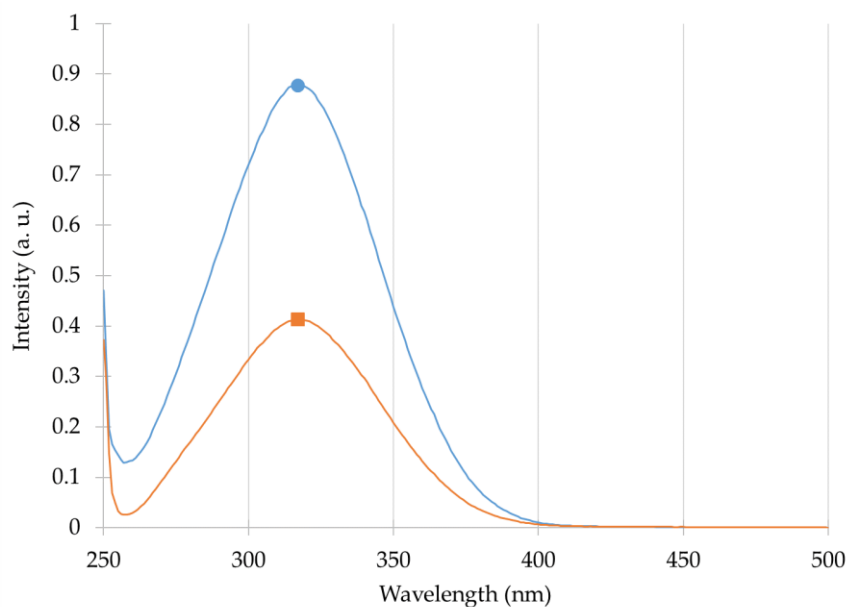


Figure S5. PNP UV/visible spectrum for (●) initial PNP solution and (■) after 8 h in photocatalytic experiment with Clay/TiO₂ sample.

References

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