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Regional clays modified with niobium: application in wastewater treatment

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This study used raw smectite clay from the Guarapuava region, Brazil, which was saturated with niobium oxide (SMOX) and niobium phosphate (SMP) and used as an adsorbent and photocatalyst for treating wastewater containing methylene blue (AM) as observed in Figure 1 [1,2]. The clays were characterized by energy dispersive X-ray fluorescence (EDXRF), vibrational spectroscopy (FTIR), spectroscopy in the ultraviolet-visible region (UV-Vis), Zeta potential (ζ), scanning electron microscopy (SEM) and colorimetry (CIE L*a*b*), allowing the presence niobium ions to be identified on the surface of the clay, as well as evaluating the different colors of the calcined clay and the adsorbed dye. The SMOX and SMP samples were used as adsorbent and photocatalyst for solutions containing AM at 25 ^{o}C, at a concentration of 400 mg L^{-1}. The samples obtained after the dye removal step were tested in the minimum inhibitory concentration (MIC) assay against two bacteria from different strains *Bacillus cereus (ATCC 10876)* and *Proteus mirabilis (ATCC 35649)*. The results showed activity for the second strain, showing a selective characteristic for Gram-negative bacteria.

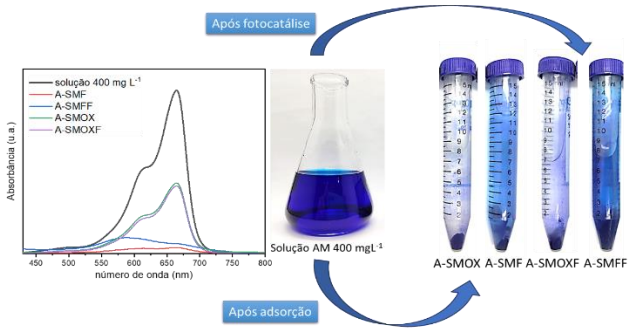

Figure 1: UV-Vis spectra and images of the AM solutions before and after the adsorption/photocatalysis assays.

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References

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