ABSTRACT:

In this study, the adsorption of a hydrophobic molecule, benzophenone-3 (BZ-3) was investigated onto three adsorbents: synthesized lipophilic organosilicate (OSₐ), Laponite (Lap) and montmorillonite (Mt). A comparative study for all adsorbents with batch adsorption experiments was achieved to determine the optimal conditions. The effects of the main experimental parameters were determined such as solvent, pH, temperature, initial concentration of BZ-3 and contact time. The adsorption capacity was evaluated by means of HPLC analysis equipped with UV detection and the adsorbent - BZ-3 complexes were characterized by means of Dynamic Light Scattering (DLS) analysis and Attenuated Total Reflectance - Fourier Transform InfraRed (ATR - FTIR) spectroscopy. Finally, the adsorption isotherm equilibrium was described according to Langmuir, Freundlich and Temkin models. The results showed that optimal value of the adsorbed BZ-3 for all adsorbents was found at pH 10, at 38 °C, with BZ-3 concentration of 2.5 g/L during 24 h of contact time. The results obtained showed a promising capacity of the OSₐ to adsorb BZ-3 (340 mg of BZ-3/g of adsorbent) compared to Lap (137 mg/g) and Mt (192.3 mg/g). Langmuir model fitted the best with OSₐ and Mt adsorption while Freundlich model fitted the best with Lap adsorption.