

Abstract

A continuous flow microwave method has been developed for the synthesis of cryptomelane-type K-OMS-2 nanomaterials in a mixed aqueous–organic solvent system. The system is ideal for multikilogram synthesis of K-OMS-2 nanomaterials. The synthesized nanomaterials have crystallite sizes of about 1.8 nm with a surface area of 213 m²/g. X-ray diffraction (XRD), electron microscopy (SEM and TEM), thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), infrared spectroscopy (FTIR), nitrogen sorption experiments, and potentiometric titrations have been used to characterize the nanomaterials. Kinetically, an increase in power has a direct relation to increase in temperature, and this has an effect on reaction rate. The synthesized materials show excellent results in the oxidation of 2,3,6-trimethylphenol.