

Electrodes Based on Zeolites Modified with Cobalt and/or Molybdenum for Pesticide Degradation. Part I: Physicochemical Characterization and Efficiency of the Electrodes for O₂ Reduction and H₂O₂ Production

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© 2018, Springer Science+Business Media, LLC, part of Springer Nature. With the purpose of obtaining inexpensive electrodes for the degradation of organic pesticides by the electro-Fenton reaction, the required H₂O₂ being obtained by the 2-electron reduction of dissolved O₂, we have prepared glassy carbon electrodes coated with a mixture of graphite with Mo- and/or Co-modified zeolites. Three zeolites were used, Linde type A (ZA), Faujasite (ZY), and MFI (ZSM5), whose maximum possible cation exchange, directly given by the Al/Si ratio, and their hydrophilicity increases in the order ZSM5 < ZY < ZA. The zeolites were modified with Mo and/or Co by the wet impregnation method and characterized by different techniques. The outer surfaces of the three Mo-modified zeolites showed Mo-containing grains (in ZA) or needles (in ZY and ZSM5), which could be largely washed away with hot water. Electrodes were made by depositing on a disc of glassy carbon (GC) a mixture of graphite, zeolite, and a bi