Determination of Heavy Metals Through Tetra Hydroxyphenyl Porphyrin-Doped Sol-Gels

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Heavy metal sensing is a critical issue because of its negative effects on the health in both humans and wildlife, as well as the damage caused to the flora in the proximal area of its release. This research investigates the application of tetra hydroxyphenyl porphyrin (H2THPP) doped silica sol-gels as reusable colorimetric sensors for the presence of heavy metals in aqueous solutions. Current heavy metal detection methods are destructive and nonreusable; consisting of color-changing solutions, colorimetric paper, etc. Aqueous solutions of Zinc chloride, Copper(II) chloride, Nickel chloride hexahydrate, Lead acetate, Chromium (III) chloride hexahydrate, and Cobalt (II) chloride hexahydrate were utilized for detection, validation, and colorimetric sensing. The interaction of the porphyrin with heavy metals, the porphyrin functionality, and the structural integrity of the doped silica sol-gel was examined using thermogravimetric analysis and UV-Vis spectroscopy. The experimental methodology and preliminary results of the research will be presented.

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