

Abstract Submitted
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Induced Interaction between Polypyrrole and SO₂ via Molecular Sieve 13X BOONCHOY SOONTORNWORAJIT, ANUVAT SIRIVAT, PPC, Chulalongkorn University — Electrical conductivity sensitivity and interaction mechanisms between polypyrrole(Ppy)/molecular sieve 13X composites and CO₂, CO, and SO₂ were investigated. Polypyrrole was synthesized and composites were fabricated from dry mixing and dispersing zeolite particles into the Ppy matrix particles, and followed by compressing into a pellet form. Effects of zeolite concentration, cation type, and cation concentration were investigated. The electrical conductivity in air of Ppy doped with naphthalene-2-sulfonic acid(β) sodium salt increased monotonically with the doping level. There were negligible negative electrical conductivity responses of Ppy and its composites when exposed to CO₂, and CO in contrast to definite positive responses towards SO₂ in which the interaction was irreversible. Undoped Ppy and doped Ppy composites at 10% v/v of zeolite13X content possessed the highest sensitivity to SO₂; beyond this volume fraction the sensitivity was reduced with increasing molecular sieve 13X content. The composites of unmodified 13X, with Na⁺ fully present within its cavity, gave the greatest electrical conductivity sensitivity towards SO₂. The sensitivity of Ppy/13X composite to SO₂ diminished when the cation Na⁺ was exchanged to other alkali cations in this decreasing order: Cs⁺, K⁺, and Li⁺.

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