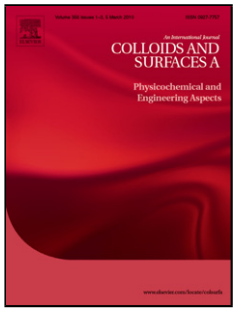

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Polyurethane-based microcapsules containing reactive isocyanate compounds: study on preparation procedure and solvent replacement

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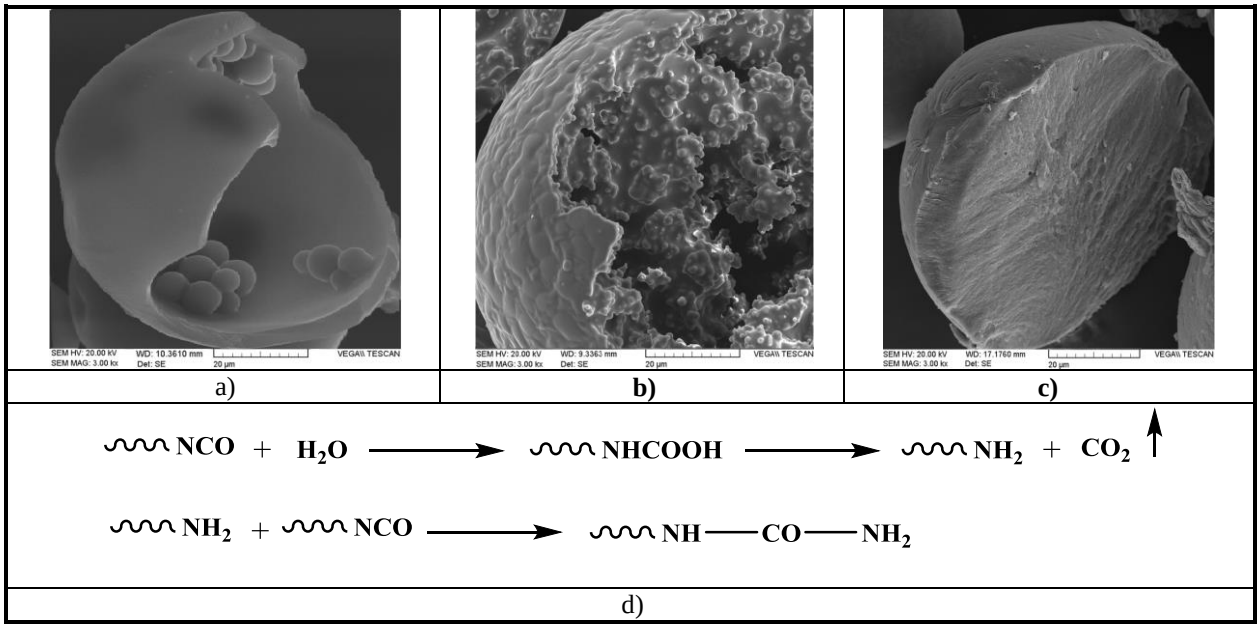
GRAPHICAL ABSTRACT



SEM micrographs of microcapsules a) before, b) after 24 h, c) after 48 h immersion in 10 wt% NaCl solution, and d) possible reactions during 48 h immersion in 10 wt% NaCl solution

Highlights

- Synthesis of PU-based microcapsules containing reactive isocyanates were studied.
- Various techniques were used for characterization of pre-polymer and microcapsules.
- The spherical microcapsules prepared in this study had a diameter of 50-200 µm.
- Toxic solvents were replaced with a benign once in the microcapsules preparation.
- Synthesized microcapsules have a smart prospect for use in self-healing coatings.

Abstract

In this study, preparation and characterization of isophorone diisocyanate (IPDI) filled polyurethane (PU) microcapsules were studied. At first, a pre-polymer was synthesized through reaction of toluene 2, 4- diisocyanate (TDI) with 1, 4-butanediol using either cyclohexanone or n-butyl acetate solvent. The synthesized pre-polymer was characterized