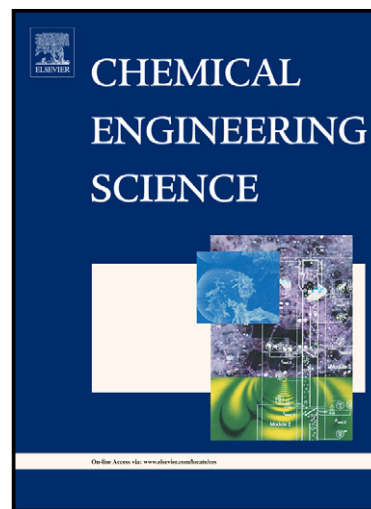


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**Chemically modified polysulfone membrane containing palladium nanoparticles:  
preparation, characterization and application as an efficient catalytic membrane for  
Suzuki reaction**

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**Abstract**

A new nanocomposite catalytic membrane was prepared based on chemically modified polysulfone and palladium nanoparticles. Modification of PSf was performed by chloromethylation and then amination with ethylenediamine. Pd (II) were anorched to amine groups of the amino functional PSf and the corresponding Pd (II) containing membrane were formed by phase inversion process. Pd nanoparticles were obtained after reduction of Pd (II) particles using NaBH<sub>4</sub> as reducing agent. After each step, the products catalwere fully characterized by means of different techniques such as FT-IR, <sup>1</sup>HNMR, TGA, DSC, UV-vis spectroscopy and SEM as need. The formation of Pd nanoparticles was studied by XRD and an average particle size about 20 nm was estimated. SEM micrographs showed Pd nanoparticles distribution throughout the catalytic membranes. In order to evaluate the catalytic properties of the membrane, Suzuki coupling reaction was carried out in a home made cell.

Keywords: Catalytic membrane, Polysulfone, Pd nanoparticles, Suzuki reaction

**1. Introduction**

The embedment of metallic catalyst into the polymer membranes has developed one of the most attractive parts of the membrane science named catalytic membrane reactor (CMR). Reducing in reaction time, quick and convenient extraction of desired products leading to reaction output enhancement, availability, immense variety of membrane types, low investment cost and the ability to be reused for several times without loss of properties are the characteristics making the

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