

*Studies on phenol permeation through supported liquid membranes
containing functionalized polyorganosiloxanes*

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ABSTRACT

Functionalized, linear, hydrophobic fluid organosiloxane polymers, namely, methylhydrosiloxane-dimethylsiloxane copolymers supported on a polypropylene microporous flat sheet membrane (Celgard 2502 and 2402) were tested as supported liq. membranes (SLMs) for phenol recovery from aq. phases into a 0.1 M NaOH phase. The functionalized polymers include, $\text{Me}_3\text{SiO}[\text{MeSi}(\text{OR})\text{O}]_x[\text{Me}_2\text{SiO}]_y\text{SiMe}_3$ (contg. $x = 15-18, 25-35$ and $50-55$ mol% of R) where R is $-(\text{CH}_2)_n\text{NMe}_2$ ($n = 3$ or 4 or 6) or $-(\text{CH}_2)_2\text{OEt}$ pendent organofunctional groups. The functionalities, R, tested were derived from com. available 3-dimethylamino-1-propanol and 2-ethoxyethanol as well as newly synthesized 4-dimethylamino-1-butanol and 6-dimethylamino-1-hexanol which have been made for the purpose of this study. The study showed that phenol permeation expressed as permeate flux through the membranes increases with the larger no. of carbon spacers in the alkyl chain of the aminoalc. pendent, larger porosity of the polypropylene support films, higher mol% of the methylhydrosiloxane portion functionalized and faster flow rates of both the feed and the receiving phases. Phenol permeation was enhanced significantly when the mol% of the methylhydrosiloxane portion was 50-55 or 25-35 with 6-dimethylamino-1-hexanol functionality supported on Celgard 2502.