

## عنوان مقاله:

CO<sub>2</sub> and CH<sub>4</sub> Permeation through SAPO-34 Zeolite Membranes Effect of Synthesis Temperature and Support Properties

## محل انتشار:

اولین همایش ملی توسعه تکنولوژی در صنایع نفت، گاز و پتروشیمی (سال: 1389)

تعداد صفحات اصل مقاله: 6

## نویسندگان:

Shirin Asarehpour - *Research Centre for Membrane Separation Processes, Faculty of Chemical Engineering, Iran University of Science and Technology (IUST), Narmak, Tehran, Iran*

Afshin Pak

Mansour Kazemi moghaddam

Toraj Mohammadi

## خلاصه مقاله:

In this research continuous SAPO-34 membranes were synthesized by secondary growth method onto both -alumina and mullite supports at three levels of synthesis temperature; 185, 195 and 220 for 24 h. The zeolite membranes synthesized were characterized by XRD, SEM and single gas permeation. It was found out that the support structural properties and synthesis temperature both have significant effects on membrane formation. By increasing synthesis temperature SAPO-34 crystals size which grown on mullite supports become uniform and smaller while crystals formed on  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> substrate become larger. The effect of synthesis temperature on single gas permeation properties of the synthesized SAPO-34 membranes was also studied. The permeance of CH<sub>4</sub> and CO<sub>2</sub> decreased as the synthesis temperature increased. But the CO<sub>2</sub>/CH<sub>4</sub> ideal selectivity versus synthesis temperature follows two different trends for SAPO-34 membranes synthesized on mullite and  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> supports. By increasing synthesis temperature, CO<sub>2</sub>/CH<sub>4</sub> ideal selectivity decreased for -alumina supported membranes while for mullite supported ones increased. Under optimum synthesis conditions at room temperature and 1 bar feed pressure the CO<sub>2</sub> permeance through -alumina and mullite supported SAPO-34 membranes were  $2.01 \times 10^{-6}$  and  $7.86 \times 10^{-8}$ , respectively and CO<sub>2</sub>/CH<sub>4</sub> ideal selectivities were 13.91 and 17.39 respectively.

## کلمات کلیدی:

SAPO-34 membranes, Mullite support,  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> support, Synthesis temperature, Ideal selectivity

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/111306>

