

## عنوان مقاله:

Application of methanol absorbent for CO<sub>2</sub> removal in gas-liquid hollow fiber membrane contactors

## محل انتشار:

هفتمین کنگره ملی مهندسی شیمی (سال: 1390)

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## خلاصه مقاله:

In the present work, the physical absorption of CO<sub>2</sub> from CO<sub>2</sub>/CH<sub>4</sub> mixture using methanol absorbent was explored by neglecting the reaction term in the model equations. In order to calculate the rates of mass transfer through the membrane and axial and radial diffusion inside the shell, through the membrane, and within the tube side of the membrane contactor, a computational mass transfer (CMT) model was used. The effects of operating conditions such as liquid velocity, gas velocity and temperature were analyzed. The calculated removal efficiencies were compared with the case that absorbent is water. It is shown that methanol solvent can successfully be used for CO<sub>2</sub> removal. It is found that the concentration distribution of CO<sub>2</sub> in the gas phase along the fiber length obeys plug flow model whereas in the methanol absorbent deeply affected by the interface concentration of CO<sub>2</sub>, absorbent velocity and CO<sub>2</sub> diffusivity. Relative absorption rate of CO<sub>2</sub> using methanol absorbent is in the range of 2.2 to 4.6 in comparison with the case of water absorbent. When the absorbent velocity is increased or gas velocity is decreased, CO<sub>2</sub> concentration decreases, but the concentration changes aren't the same for equally velocity step size in both gas and .absorbent. The model results showed that gas velocity has small effect on liquid phase CO<sub>2</sub> concentration

## کلمات کلیدی:

Membrane contactors, CO<sub>2</sub> removal, Physical absorption, Methanol, CMT

## لینک ثابت مقاله در پایگاه سیویلیکا:

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