

عنوان مقاله:

Determination of thermodynamic parameters of hydrogen permeation of palladium membrane for considering the effect of stainless steel support

محل انتشار:

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خلاصه مقاله:

A palladium composite membrane was prepared by electroless plating on oxidized porous stainless steel support (ox-PS S). Hydrogen permeation flux through this composite membrane was measured in the temperature range of 574-674 K and the pressure difference of two sides of membrane up to kPa90. A simplified resistance model was employed to analyze the permeation behavior of hydrogen through Pd/ox-PSS membrane for calculating the contribution of each layer in resistance against the hydrogen transport. The amount of enthalpy of hydrogen dissolution of palladium membrane is -9.4 kJ/mol. Considering a complete detailed model, this value was used for discussing the effect of interaction of metal-support on hydrogen exiting from the palladium layer at the downstream side. Several composite membranes which differ in support material has been compared with each other. It was confirmed that the metal-support interaction, plays an effective role in exiting activation energy. In Pd/ox-PSS composite membrane, the metal-support interaction decreases hydrogen exiting rate from Pd membrane's downstream side.

کلمات کلیدی:

Palladium composite membrane, Enthalpy of hydrogen dissolution, Porous stainless steel support

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