Proton exchange membrane electrolyzer for electrochemical hydrogen production from HyS process

김나영, 김덕준*
성균관대학교 화학공학과
(djkim@skku.edu*)

HyS thermochemical process which can generate hydrogen by environmental friendly method is in the limelight. There is SO_2 depolarized electrolyzer, which is the essential electrochemical process in HyS process. And it consists of anode, cathode and proton exchange membrane. In this process, SO_2 gas in the anode side can penetrate into cathode side through polymer membrane, decreasing overall efficiency. To prevent this phenomenon, it is important to find the membrane which has minimum SO_2 gas permeability. Nafion and sPEEK which are being used widely to Fuel cell was first studied. And the PAMPS/PAAm DN gel was used to make proton exchange membrane. It is similar as semi-IPN, and PAMPS/PAAm DN gel consists of rigid and brittle PAMPS and flexible PAAm, so mechanical property can be improved. To get stable membrane, we introduce PVA into DN gel. After preparing the membrane, measuring SO_2 permeability, mechanical property, water uptake and proton conductivity are studied in this report.