Contribution ID: **214** Type: **not specified**

Hydrogen Adsorption Performance for Large-scale Cryogenic Molecular Sieve Bed

Tuesday, 18 September 2018 16:00 (20 minutes)

Cryogenic hydrogen adsorption using molecular sieve beds is considered to be one of the main candidate processes for recovery of produced tritium from purge gas in breeding blankets and it has been chosen for separation of hydrogen isotopes in Tritium Extraction System (TES) of Korean Helium Cooled Ceramic Reflector (HCCR) Test Blanket System (TBS). Various absorbents and their performance have been studied for the cryogenic adsorption using small-scale experiments, however large-scale experiments comparable to TBS-relevant scale are required to have sufficient confidence for component design and performance prediction of Cryogenic Molecular Sieve Bed (CMSB) for the TBS and beyond. To properly evaluate hydrogen adsorption performance for large size CMSB, a series of experiments have been performed using PGLoop facility constructed and operated in National Fusion Research Institute. The experimental conditions were set to include breeding blankets relevant parameters. The hydrogen partial pressure ranges from 100 Pa to 600 Pa, and testing with different swamping ratios, flow rates and total pressures were conducted to see their effect on the performance. While a slight reduction in hydrogen adsorption performance is observed compared to the small isotherm experiments, which can be attributed to size effects, it is shown that the experimental results reasonably agree well with existing literature data.

Co-author: AHN, Mu-Young (National Fusion Research Institute)

Presenter: AHN, Mu-Young (National Fusion Research Institute)

Session Classification: O2.C