

Computational Analysis of Hydrogen Storage Containers Using Intermetallic Compound

조형위, 박병홍[†]
한국교통대학교
(b.h.park@ut.ac.kr[†])

Hydrogen is in the spotlight as the ultimate and sustainable clean energy alternative to fossil fuels generating greenhouse gases and fine dusts. Hydrogen storage technology is important to utilize the hydrogen. There are various ways to store hydrogen in gas, liquid, and solid state. Among them, the method of storing as solid has the advantage of lower operating pressure at room temperature than other storage methods. Usually, the hydrogen storage as solid uses intermetallic compounds for containing hydrogen in interstitial sites of the compounds. Reactors adopting the intermetallic compounds as storage materials emit high heat energy during absorption or reaction of hydrogen. Therefore, a computer analysis is required for designing a reactor applies intermetallic compounds as a storage material. In this study, governing equations including mass and energy balances were developed and computational analysis was carried out to understating the change of temperature in the reactor and cooling medium.