

Simulation Study on Purification Column in Bunsen reaction for Sulfur Iodine Cycle for Hydrgen Production

박준규, 이인범[†], 이건홍
포항공과대학교
(iblee@postech.ac.kr[†])

Hydrogen is the promising candidate for the future alternative energy carrier. The Sulfur-iodine (SI) cycle is one of the most leading thermo-chemical water splitting technologies for massive hydrogen production. SI cycle is cyclic process that consists of three reactions. The Bunsen reaction is intermediate step in which products from decomposition steps recycle back as reactants in Bunsen reaction. The Bunsen reaction is intermediate step in which products from decomposition steps recycle back as reactants in Bunsen reaction. SO_2 from sulfuric acid decomposition recycles while I_2 and H_2O from HI decomposition step recycle. The products of Bunsen are separated into two liquid layers and one gas stream, which are HI_x phase consisting of HI , I_2 , H_2O , SA phase consisting of H_2SO_4 and H_2O , and oxygen layer has oxygen and sulfur dioxide. Each liquid layer carries impurity in which HI_x has H_2SO_4 impurities and H_2SO_4 has HI layer. The simulation on purification column to remove impurities in each liquid phase with ASPEN PLUS was carried out to validate with experimental results. Trade-off between the main reactor and separator with variation of oxygen in the feed has been carried out.