

Heat capacity measurement of HI-I₂-H₂O system in the sulfur-iodine cycle for hydrogen manufacture

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The Sulfur-Iodine thermochemical cycle (SI cycle) for water splitting is one of the most promising processes to generate sufficient amount of hydrogen from nuclear energy. The formerly announced section III in SI cycle, which consists of concentration, decomposition and separation of HI-I₂-H₂O mixture (HIx mixture), is the most crucial section because this section determines the hydrogen product yield of SI cycle. The heat capacity of HIx mixture is one of the important properties, since the study of these data is important for simulation and optimization of SI cycle. In this work, heat capacity of HIx mixture is measured by a designed apparatus. This apparatus is designed as a Calvet-type calorimeter consisting of a thermal insulator, a thermometer, a heater and a sample bottle. The experiment is performed at an atmospheric pressure and at temperature range of 323.15K to 425.15K. The results from the experiment will be used for the basic design of section III in SI cycle process.