

### Exergetic Analysis of 9-Ethylcarbazole Application for LOHC Purpose

최인영, 신병수, 강정원\*

고려대학교

(jwkang@korea.ac.kr\*)

LOHC(Liquid Organic Hydrogen Carrier) can store hydrogen with the hydrogenation reaction. It is promising as a hydrogen storage technique with hydrogenation in that it can be applied in existing energy infrastructure such as diesel because of its similar physicochemical properties and it is reusable after the separation of hydrogen from hydrogenated compound. Some candidates of LOHCs were evaluated about availability of hydrogen storage analyzing its hydrogenation and dehydrogenation reaction thermodynamically for its reversibility. In this work, storage of hydrogen with carbazole compound, one kind of LOHCs, is analyzed about thermodynamic efficiency approached from the exergetic concept with Aspen Plus. Loss of exergy(lost work) during hydrogen storage process accounts for less than 30% of loss of exergy in the storage process combined with fuel cell.