

Group name	<b>Group of Functional Molecular Chemistry</b>
Staff (e-mail)	Takeshi Higuchi(higuchi++yz.yamagata-u.ac.jp) (Please substitute “++” with “@” to use)
Group Homepage	<a href="http://vweb.yz.yamagata-u.ac.jp/k5/">http://vweb.yz.yamagata-u.ac.jp/k5/</a>
Main Subjects	<ol style="list-style-type: none"> <li>1. Synthesis of porous materials by phase separation</li> <li>2. Gas separation with porous membrane</li> </ol>

#### Content

Our group has developed a hierarchical porous material fabricated through sol-gel process and phase separation, namely spinodal decomposition (SD). This material has both macropore ( $> 1\mu\text{m}$ ) and nanopore ( $< 50\text{nm}$ ), which are generated by SD and removal of polymer from precursory composite by heat treatment, respectively. Such bimodal porous structure permits high permeability of inner fluid and high adsorption capacity concurrently.

Application of these materials to separation membrane element for dehydration of ethanol and purification of carbon dioxide is also studied.

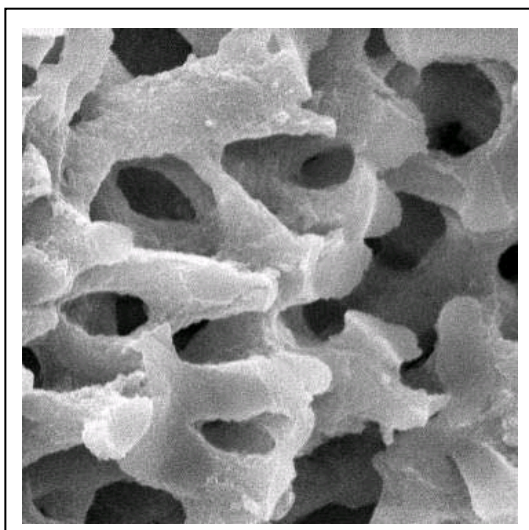


Figure 1 Scanning microscope image of macroporous silica-polymer composite as a precursor of hierarchical porous material.