

### Synthesis of SAPO -57 and SAPO -59 with Different Si Contents and Their Catalytic Properties for the Methanol -to -Olefin Reaction

\_\_\_\_\_, Christopher P. Nicholas<sup>1</sup>, Gregory J. Lewis<sup>1</sup>, \*  
POSTECH, <sup>1</sup>UOP LLC  
(sbhong@postech.ac.kr\*)

Very recently, Lewis and co-workers have reported the synthesis of silicoaluminophosphate (SAPO) molecular sieves SAPO -57 and SAPO -59 with novel ABC-6 net framework structures based on a framework charge density -induced crystallization approach. Both SAPO -57 and -59 have interesting structural relevance with SAPO -34 (framework type CHA) in that all of their structures can be described by the stacking of 6-rings along the hexagonal c-axis, but have different cage-based framework architectures. Despite the unique structural features, however, there is little known on the physicochemical and catalytic properties of these new SAPO molecular sieves. Here we report on the highly reproducible synthesis of SAPO -57 and -59 with different Si contents. The SAPO materials prepared here are characterized by using various analytical tools including powder XRD, elemental and thermal analyses, N<sub>2</sub> adsorption, multinuclear solid-state NMR, IR, and ammonia TPD. Their catalytic properties for the methanol -to -olefin conversion have also investigated and compared with those observed for H-SAPO -34 and H-SAPO -35 (LEV).