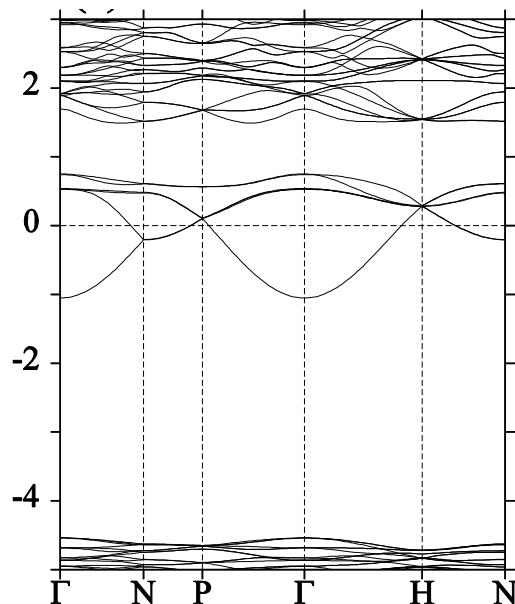
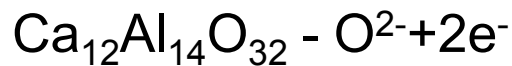
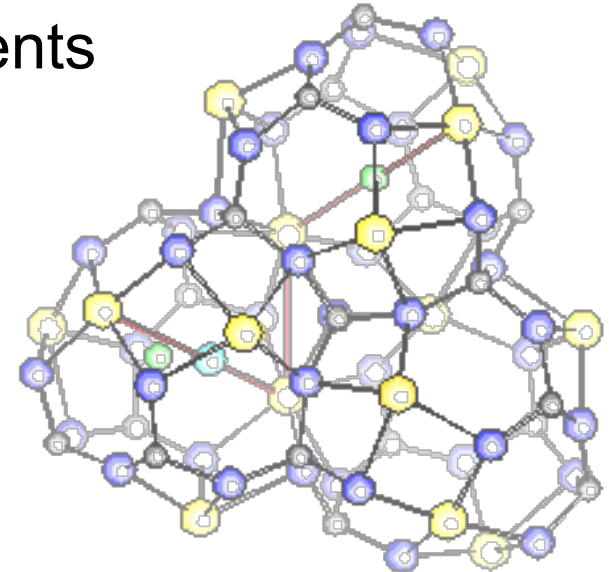


# Nano-porous materials

$12\text{CaO}\cdot 7\text{Al}_2\text{O}_3$  – member of Portland cements

- 6 cages/unit cell, each is 5.6 Å across
- “free”  $\text{O}^{2-}$  ions in one of the six cages
- Upon oxygen reduction,  $\sigma = 1700 \text{ S/cm}$



Ca d, Al p-states

Ca, Al s + O p

O p-states

The calculated electron velocity ( $5.6 \cdot 10^{-5} \text{ m/s}$ ), is nearly the same as in TCO-prototype,  $\text{In}_2\text{O}_3$  ( $5.9 \cdot 10^{-5} \text{ m/s}$ )