



Electro-conductive & Transparent Nano-porous Compound C12A7

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1. Novel Compound $12\text{CaO} \cdot 7\text{Al}_2\text{O}_3$ (i.e. C12A7)

- C12A7 is composed of materials of alumina cements, and has 6 cages with an inner free space of 0.4nm of which only one cage is filled by O^{2-} . These 80% cages are free spaces.
- The oxide ions can be replaced by various anions such as O^- , H^- , OH^- , e^- etc and show very interesting functions.

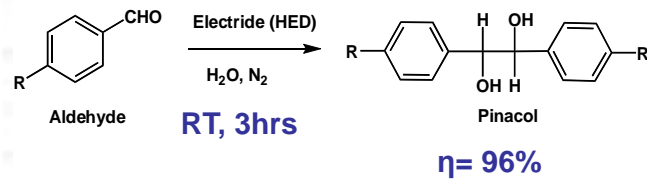
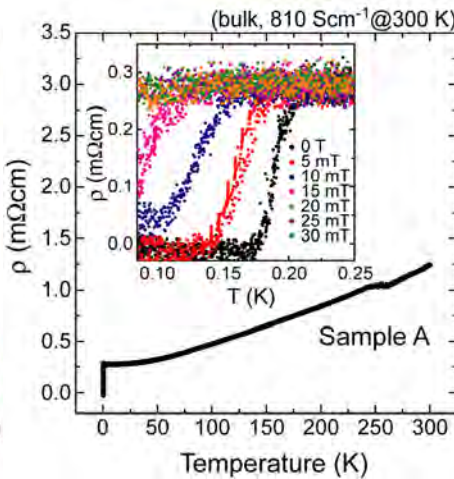
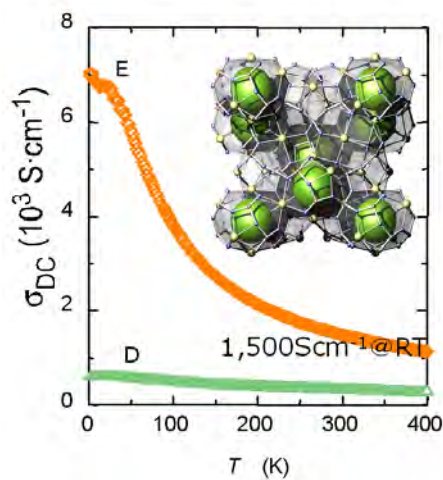
The diagram illustrates the synthesis and properties of C12A7 with different anions:

- C12A7:O²⁻**: Shown as a ball-and-stick model with Al^{3+} and Ca^{2+} ions. It is a strong oxidizer.
- C12A7:H⁻**: Shown as a ball-and-stick model with a hydrogen atom in a cage. It is electro-conductive by photo-irradiation and a reducer.
- C12A7:e⁻**: Shown as a ball-and-stick model with an electron in a cage. It is highly electro-conductive and a strong reducer.

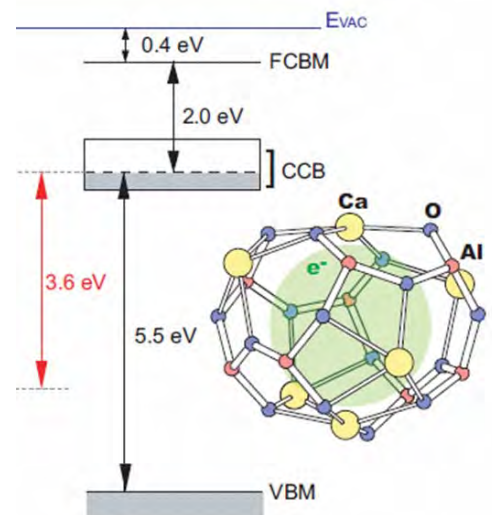
A schematic shows the photo-irradiation process: a mask is placed over a C12A7:H⁻ film, and a light source (represented by a light bulb) is used to create a conductive path, which is then connected to a battery.

2. Electride C12A7: e⁻

- Conductivity of C12A7: e⁻
- Superconductor of C12A7: e⁻
- Reduction reaction using C12A7: e⁻



3. Small work function of C12A7: e⁻



Patent Licensing Available

Patent No. :US6818192,7462334.7235225,7507289,7465433,
EP1717217, JP4147324,4219821,4245608,
TW283234 etc

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