

Superconductivity of infinite layer cuprate

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The infinite layer compound $ACuO_2$ (A-Alkaline earth) consists of infinite stacking of CuO_2 planes separated only by alkaline earth ions.

This compound attracted much attention because it contains only key ingredient of all cuprate high temperature superconductor; CuO_2 plane with controllable carrier concentration without charge reservoir block.

High pressure synthesis method has been found to be preferable for this system due to its ability of doping various lanthanide ion into A site with larger superconducting volume fraction. But rigorous study on this rudimentary compound has been hindered by insufficient quality of sample. Especially superconducting volume fraction was often too small to identify its origin. In this presentation, we report high pressure synthesis of $Sr_{0.9}Ln_{0.1}CuO_2$ ($Ln=La, Sm$). By controlling the heating temperature precisely during high pressure synthesis we could have superconductors with quite high superconducting volume fraction for this compound. The magnetic properties of the grain aligned samples show very different behavior compared to the cuprate high temperature superconductors. Details will be discussed.