

**Effect of High Oxygen Pressure Annealing on  
Superconducting Nd<sub>1.85</sub>Ce<sub>0.15</sub>CuO<sub>4</sub> Thin Films by  
Pulsed Laser Deposition from Cu-enriched Targets**

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**Abstract** - We show that the quality of Nd<sub>1.85</sub>Ce<sub>0.15</sub>CuO<sub>4</sub> films grown by pulsed laser deposition can be enhanced by using a non-stoichiometric target with extra copper added to suppress the formation of a parasitic (Nd,Ce)<sub>2</sub>O<sub>3</sub> phase. The properties of these films are less dependent on the exact annealing procedure after deposition as compared to films grown from a stoichiometric target. Film growth can be followed by a 1 bar oxygen annealing, after an initial vacuum annealing, while retaining the superconducting properties and quality. This enables the integration of electron-doped cuprates with their hole-doped counterparts on a single chip, to create, for example, superconducting *pn*-junctions.

**Keywords** - Thin film, pulsed laser deposition, PLD, neodymium-cerium cuprate, PLD copper-enriched target, oxygen annealing, hole-doped cuprate, superconducting *pn*-junction