

Fig. S1. MgO-Co<sub>1-x</sub>O phase diagram for P(O<sub>2</sub>) = 0.21 atm (FACT oxide data base).

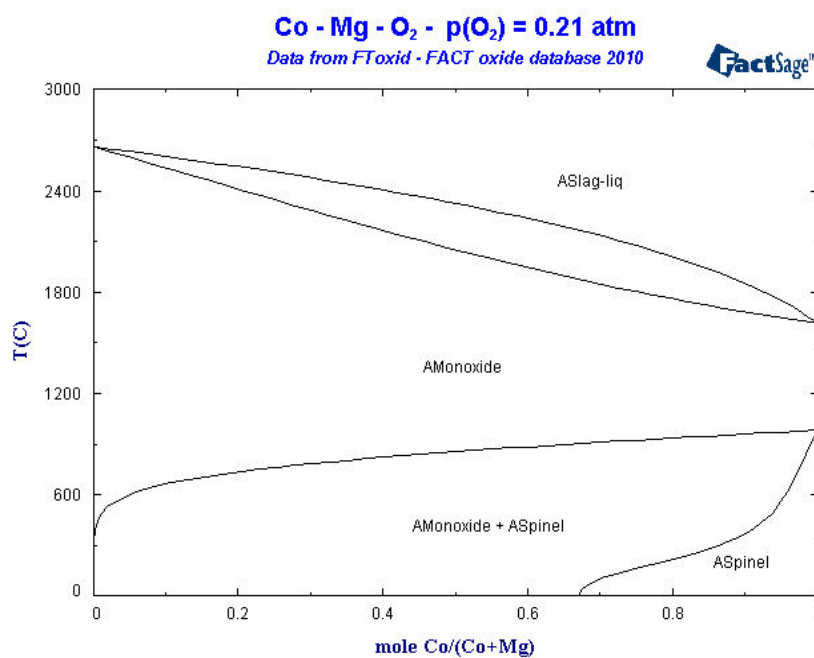


Fig. S2. XRD (CuK $\alpha$ ) trace of rocksalt type (Co<sub>x</sub>Mg<sub>1-x</sub>)O in (a) C1M9, (b) C5M5 and (c) C9M1 target samples prepared by reactive sintering at 1600°C for 5 h in air showing additional minor Mg-doped Co<sub>3- $\delta$</sub> O<sub>4</sub> spinel in (c).

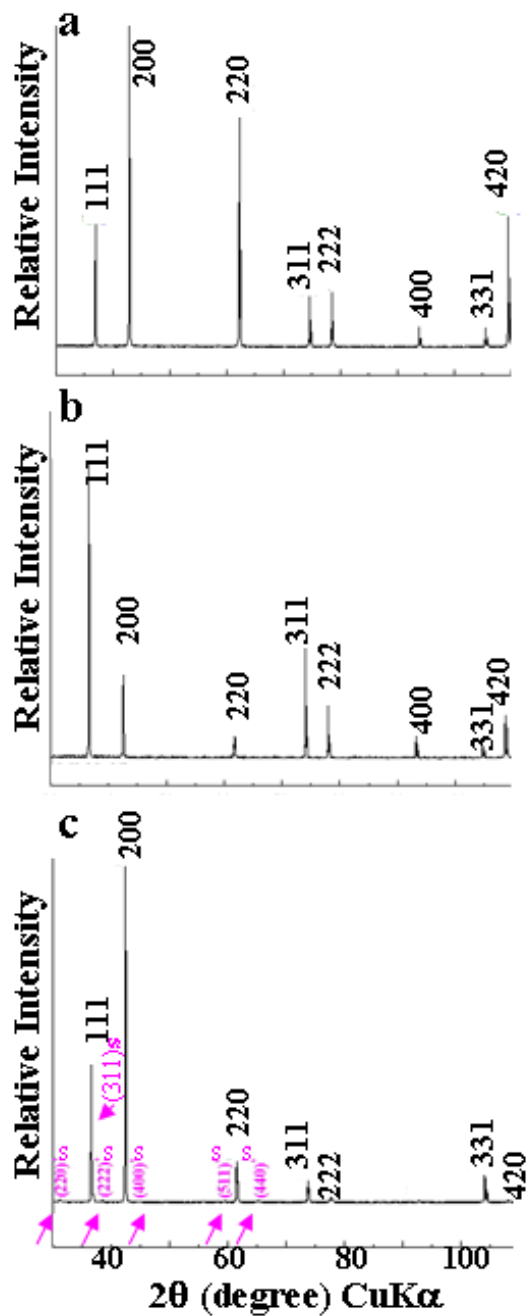


Fig. S3. Photos of solid solution targets (a) C1M9, (b) C5M5 and (c) C9M1 with pink, dark and gray color, respectively, in contrast with the laser ablated darkish trough (arrow).

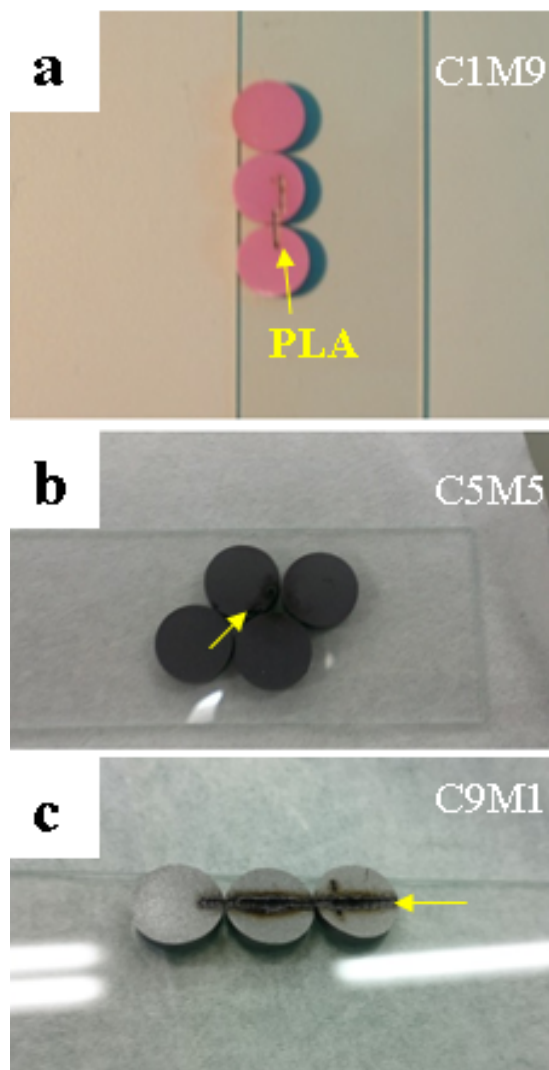


Fig. S4. SEM SEI of the C5M5 specimen showing (a) the reactively sintered grains ca. 10 to 20  $\mu\text{m}$  in size with inter- and intragranular pores, (b) PLA created crater with rapidly solidified molten droplets and flow, (c) and (d) further magnified from the rectangular area at the crater opening showing finer recrystallized grains with whiskers (arrow) decorated at the crack openings.

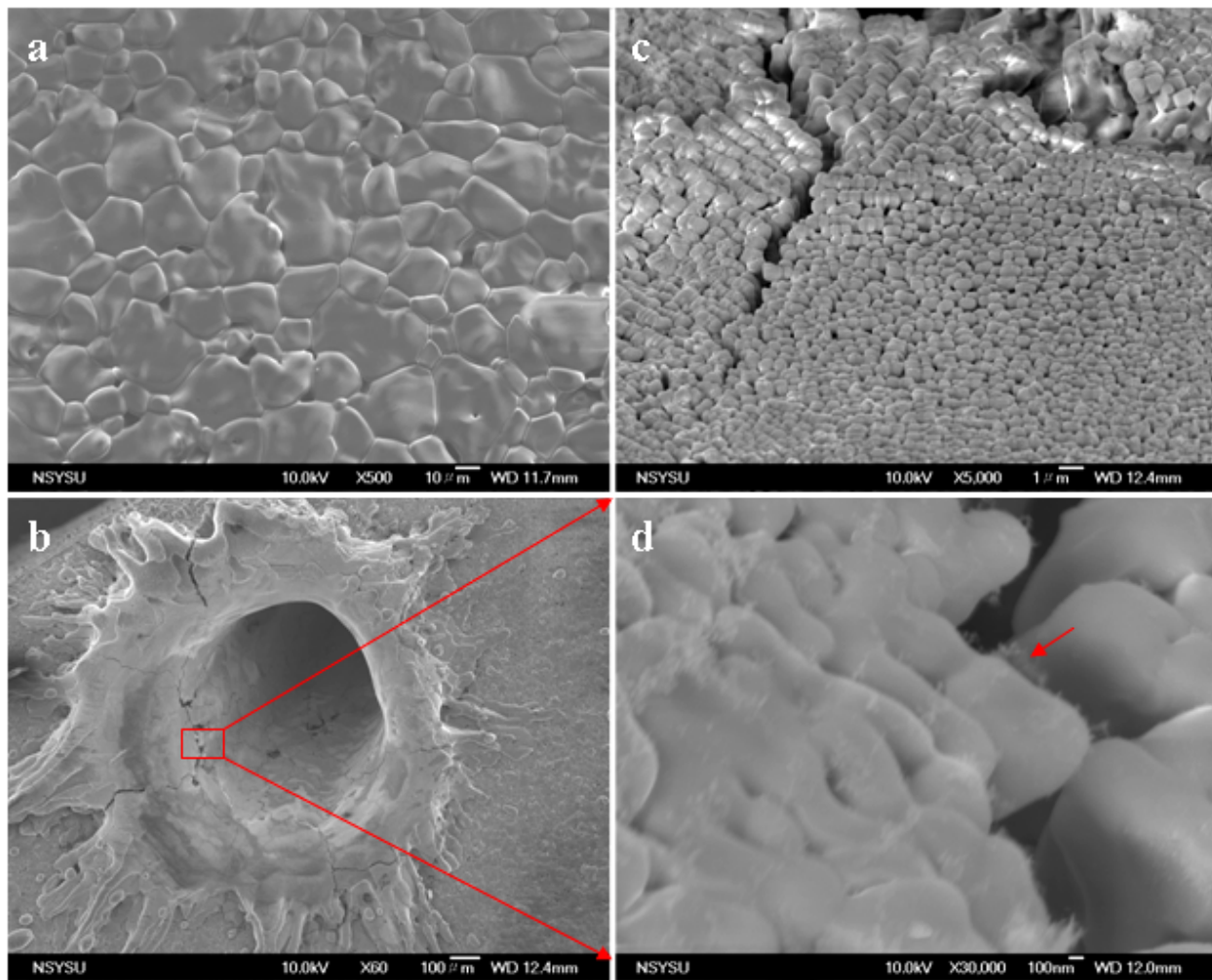


Fig. S5. TEM BFI (left panel) and SAED pattern (right panel) of rocksalt type  $(\text{Co}_x\text{Mg}_{1-x})\text{O}$  nanocondensates/particulates with cubic/round shape as formed by PLA of (a) C5M5 and (b) C9M1 in air for 5 sec.

