

Supplementary Information

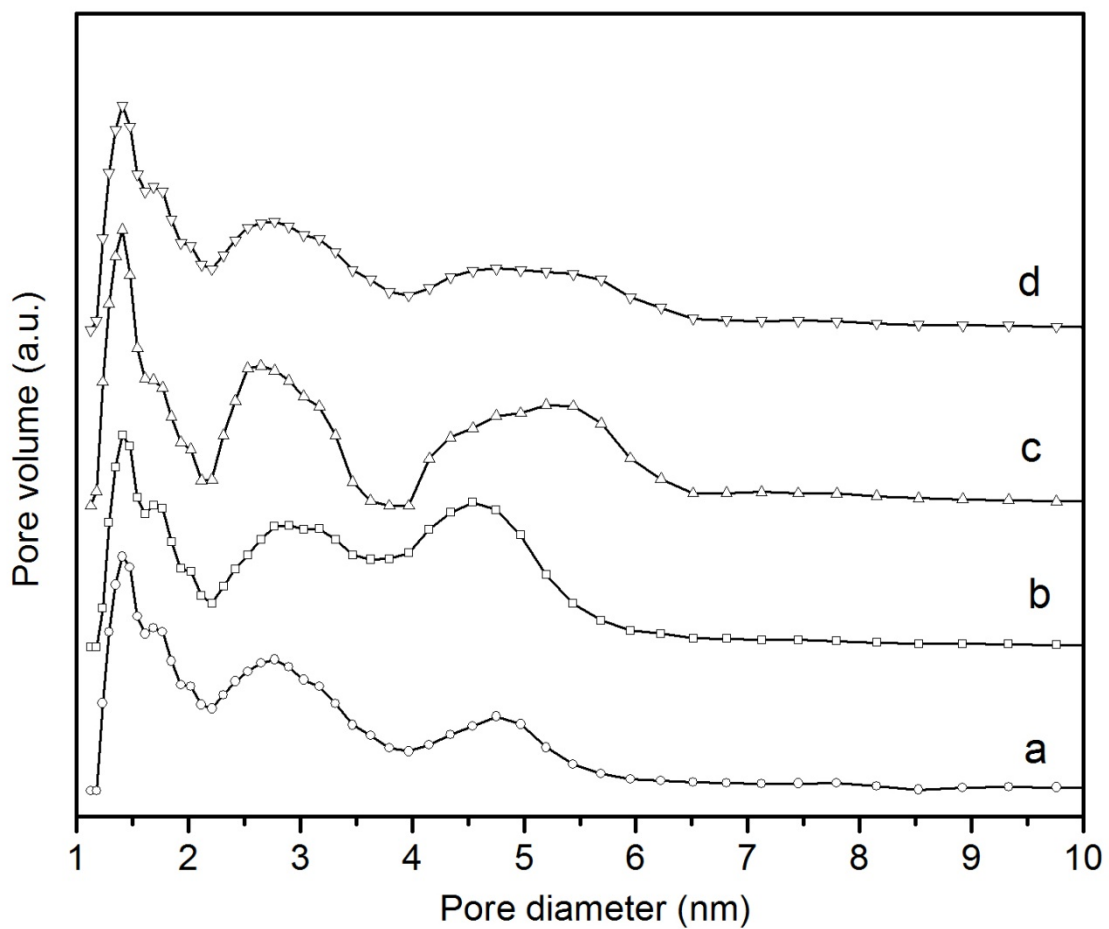


Fig. S1. Pore size distribution curves of metal nitrides (a) MoN, (b) 1CoMoN (c) 3CoMoN (d) 5CoMoN

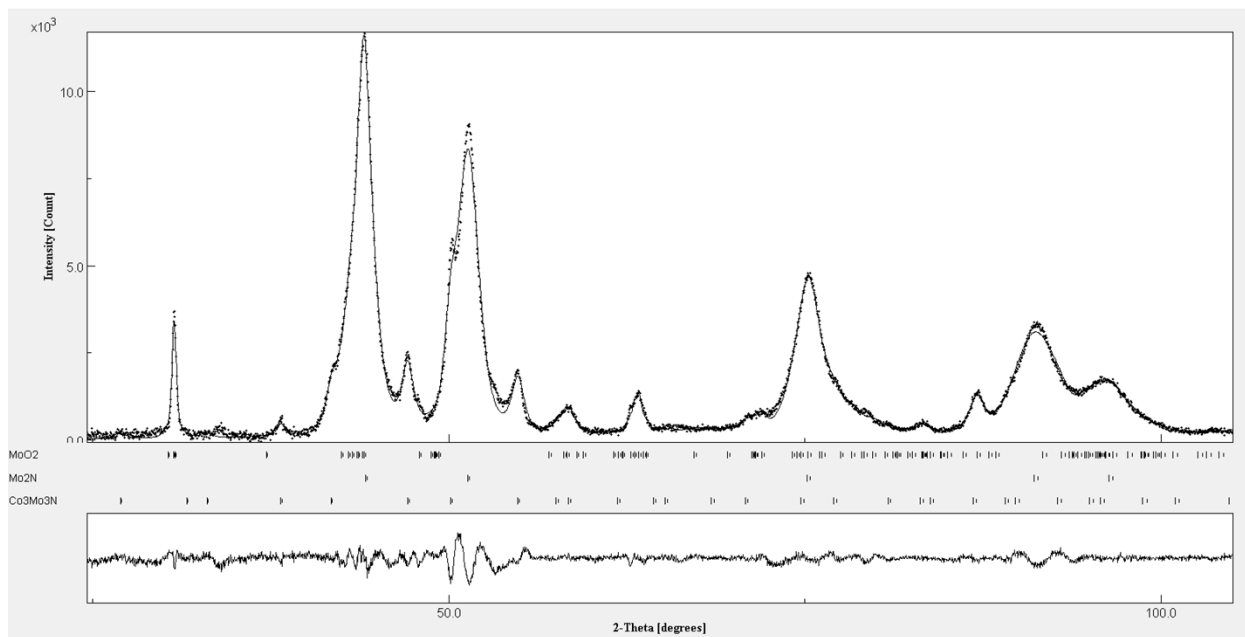


Fig.S2. Rietveld refinement analysis of XRD data of 5CoMoN catalyst

All phases are well defined; we introduce the PDF cards of them in MAUD program implemented with instrumental setup. Then we fix the crystallographic parameters and we just refine composition and crystal size using an isotropic approximation (spherical particles). Refinement details and Pdf card will be included below.

Refinement details for sample 5CoMoN:

Rw (%) = 14.4, Rwnb (% , no bkg) = 19.6

Rb (%) = 7.6, Rexp (%) = 2.8

Phase/ ICSD reference / % mass \pm error

Co₃Mo₃N (ICSD N°180409), weight %: 6.9 \pm 0.045

γ -Mo₂N (ICSD N°158843), weight %: 89.6 \pm 0.89

MoO₂ (ICSD N°80830), weight %: 3.4 \pm 0.02

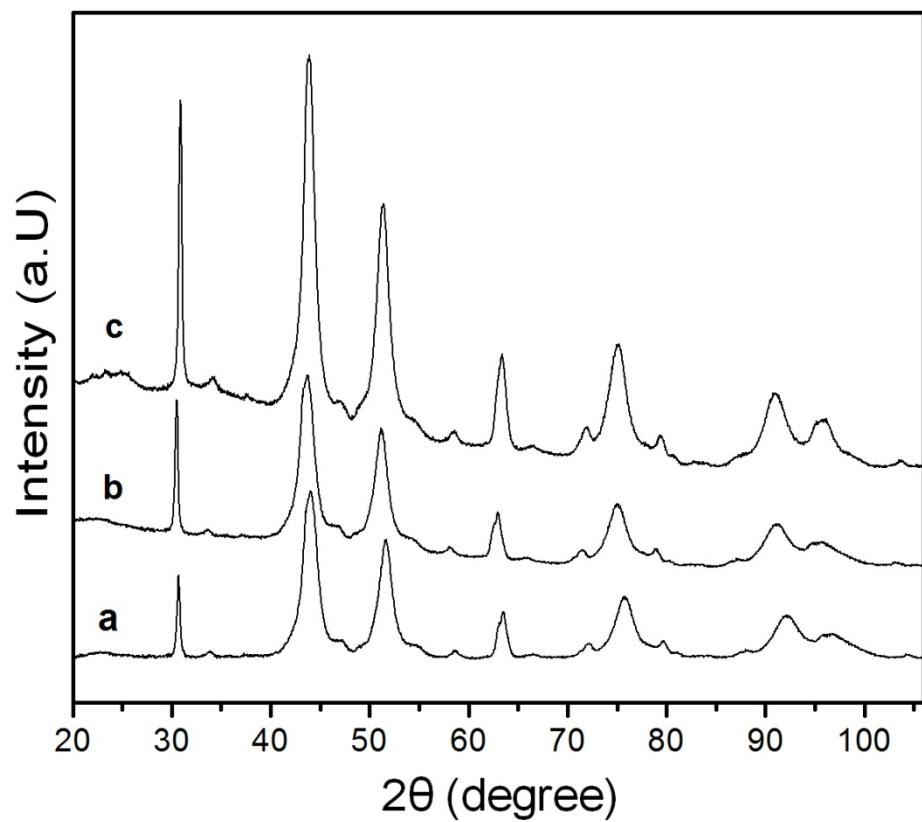


Fig.S3. XRD patterns of (a) Fresh, (b) Reduced and (c) Used catalysts of 3CoMoN