Synthesis and Characterization of New Red Phosphors for White LED Applications

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Figure 1 shows the TG/DTA curves in a synthetic air atmosphere for the decomposition of the precursor of BMO (Stoichiometric amounts of $BaCO_3$ and $(NH_4)_6Mo_7O_{24}{\cdot}4H_2O$). The thermogravimetric analysis (TGA curve) of the materials shows about two decomposition stages. The TGA indicated a minor weight loss (3.8%) between 190°C and 400°C, what corresponds to the decomposition of $(NH_4)_6Mo_7O_{24}{\cdot}4H_2O$ and elimination of NH_3 and H_2O. The other weight loss (8.6%) occurs between 400°C and 700°C, which is due to the decomposition of $BaCO_3$ and elimination of CO_2. After 700°C, no obvious weight loss was observed.

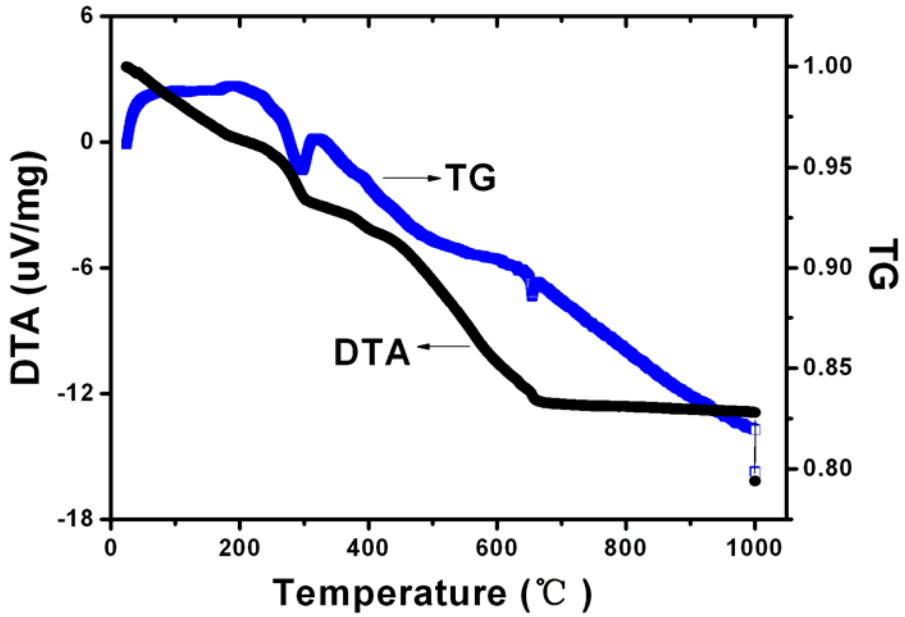

Fig. S1 TG/DTA curves of the BMO precursor in synthetic air, using a constant heating rate of 10°C/min

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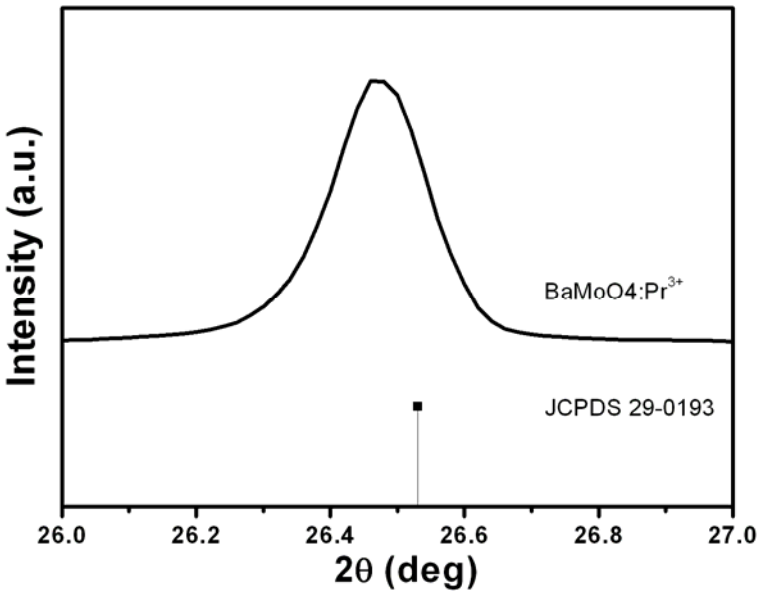

Fig. S2. Enlarged version of XRD patterns of $BaMoO_4$: Pr^{3+} phosphor sintered at 800^{o}C from 26^{o}C to 27^{o}C.

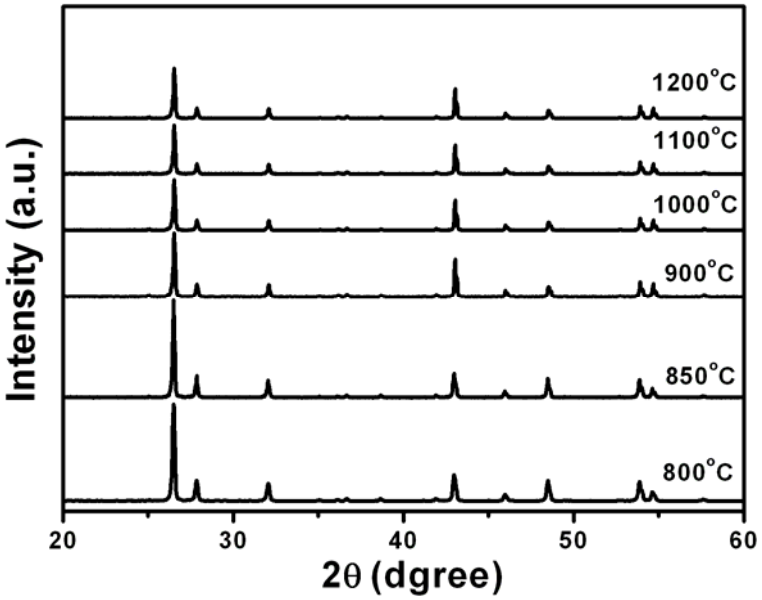

Fig. S3. XRD patterns of as-prepared products sintered in different temperatures.

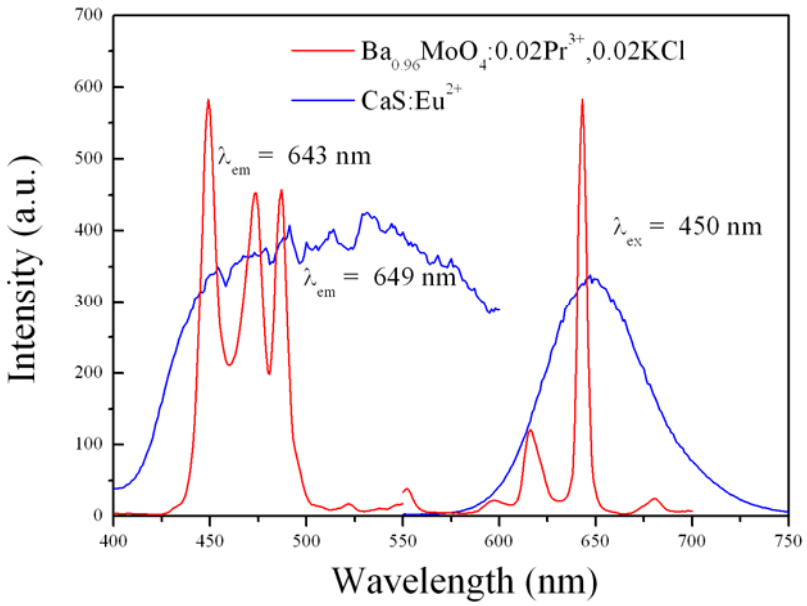

Fig. S4. The excitation spectra of $Ba_{0.98}MoO_4$:0.02Pr^{3+}, 0.02KCl (λ_{em} = 643 nm) and CaS:Eu^{2+}(λ_{em} = 649 nm), the emission spectra of $Ba_{0.98}MoO_4$:0.02Pr^{3+}, 0.02KCl and CaS:Eu^{2+}(λ_{ex} = 450 nm).