

# **$\text{Bi}_{3-x}\text{M}_3\text{O}_{11+\delta}$ (M=Cr, Rh, Ir, Pt, Pd): A series of new $\text{KSbO}_3$ -type structural magnetic materials**

Wei Yi, Alexei A. Belik

*International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Japan.*

$\text{KSbO}_3$ -type family is interesting because it can adopt three interpenetrating networks with the composition changing from  $\text{ABO}_3$  ( $\text{KSbO}_3$  and  $\text{KIrO}_3$ ) to  $\text{ABO}_{3.667}$  ( $\text{Bi}_3\text{Ru}_3\text{O}_{11}$ ,  $\text{La}_3\text{Ru}_3\text{O}_{11}$ , and  $\text{Bi}_3\text{GaSb}_2\text{O}_{11}$ ). Recently *Belik et. al* reported a new  $\text{KSbO}_3$ -type random ferrimagnet  $\text{Bi}_3\text{Mn}_3\text{O}_{11}$  with high  $T_c$ . Here we reported a series of new  $\text{KSbO}_3$ -type structural materials  $\text{Bi}_{3-x}\text{M}_3\text{O}_{11+\delta}$  (M=Cr, Rh, Ir, Pt, Pd) synthesized by high pressure and high temperature (HPHT). We investigated the effects of oxygen content on the structural, physical, and chemical properties of these materials, because a wide variation of  $\delta$  value (changed from -0.5 to 0.6) in this system keeps the same cubic structure. In addition, we also studied the effects of Bi content on the structure, physical, and chemical properties. The value of x was changed from 0 to 0.4 in single crystal  $\text{Bi}_{3-x}\text{Cr}_3\text{O}_{11+\delta}$ .