

key factors for high  $T_c$ :

- Strong electron correlation
- Moderate magnetic order
- d-p level synchronization

Localized d spins and conducting p electrons

map with the d-electron number

| 3d TM                 | Ti | V | Cr | Mn | Fe | Co | Ni | Cu |
|-----------------------|----|---|----|----|----|----|----|----|
| z in s'd <sup>z</sup> | 2  | 3 | 4  | 5  | 6  | 7  | 8  | 9  |

Valence (d-electron number)

Where is the next one?

Ti: a (TiO<sub>2</sub>), b (BaTi<sub>3</sub>Sb<sub>5</sub>O), c (α-Ti<sub>2</sub>O<sub>3</sub>), d (LiTi<sub>2</sub>O<sub>6</sub>), e (SrTiO<sub>3</sub>), f (CaTiSe)  
 V: a (CaV<sub>2</sub>Sb<sub>2</sub>), b (β-Na<sub>2</sub>V<sub>2</sub>O<sub>7</sub>)  
 Cr: a (KCr<sub>2</sub>As<sub>2</sub>), b (CrAs)  
 Mn: a (KMn<sub>2</sub>Bi<sub>2</sub>), b (MnP)  
 Fe: a (Ba<sub>2</sub>X<sub>2</sub>Fe<sub>2</sub>As<sub>2</sub>), b (LaOFeP), c (FeSe), d (S<sub>2</sub>), e (SmFeAsO), f (Fe<sub>2</sub>COO<sub>2</sub>·1.3H<sub>2</sub>O), b (Na<sub>2</sub>CoSe<sub>2</sub>)  
 Ni: a (S<sub>2</sub>), b (La<sub>2</sub>PNi<sub>2</sub>O<sub>8</sub>), c (YNi<sub>2</sub>B<sub>2</sub>C), d (214), b (La214)





# Solid State Chemistry Conference



