Process for electronic materials of layered homologous compound

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Background

- RM_2O_4 (R = Y etc., M = Fe, Ga etc.) compound discovered at this laboratory is a layered compound in which transition metal atoms and rare earth atoms are arranged in a triangular lattice. Magnetic, electrical conductivity, etc. have been investigated.

Aim

- $InMO_3$ (ZnO) m (M: Fe, Ga, Al, m: natural number) derived from RM_2O_4 (R = Y etc., M = Fe, Ga etc.) compound is sandwiched between the $InMO_3$ layer and the ZnO layer. We synthesize many functional materials using the existence of many homologous phases and investigate the relationship between structure and function.

Advanced Research Topics

$InGaZnO_4$ which is homologous phase and m = 1 has attracted attention as an alternative material to the ITO film.

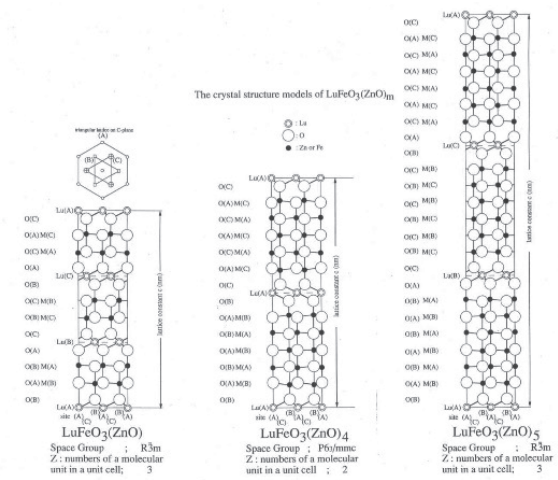

Fig. 1. Crystal structure of $RMO_3(ZnO)m$ (R=Lu,M=Fe) .

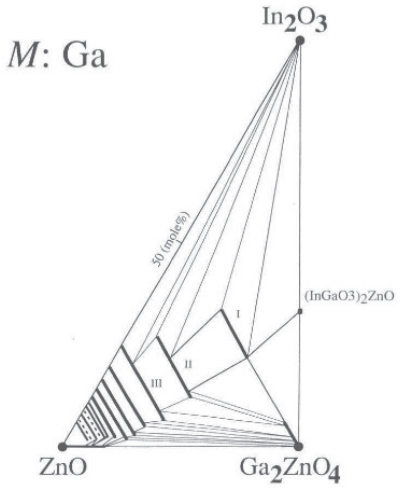

Fig. 2. Phase diagram of In_2O_3-Ga_2ZnO_4-ZnO at 1350 ℃.

Publications

- M. Nakamura et al., J. Solid State Chem., 86 (1990) 16.
- C.Li Solid state physics 35 (2000) 23.
- N. Kimizuka edited Physics and of crystalline oxide semiconductor CAAC-IGZO (2017) Wily.

Summary

- The layered compound RM_2O_4 (R = Y etc., M = Fe, Ga, etc.) is a layered compound capable of arranging various kinds of elements.
- The homologous compound $InMO_3$ (ZnO) m can form a large number of compounds with ZnO.

Research outcome

- We explore the application to other than transparent electrodes by exploring the relationship between structure and function in more detail.