Faculty of Science and Technology
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Development of Advanced Inorganic Materials

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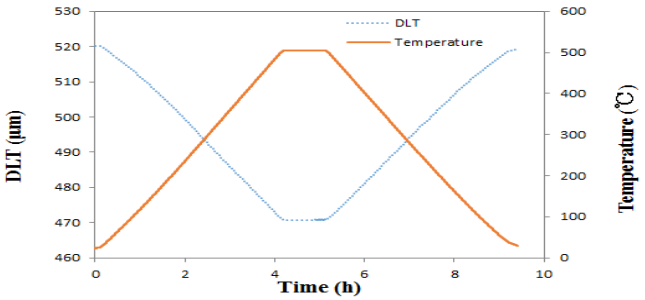

Fig.1. Diagram for dilatometry of $Zr_2(WO_4)(PO_4)_2$.

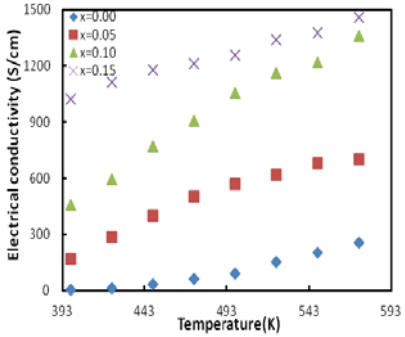

Fig. 2. Electric conductivities of $La_{1-x}Ca_xCoO_3$ (x = 0.00, 0.05, 0.10, 0.15)

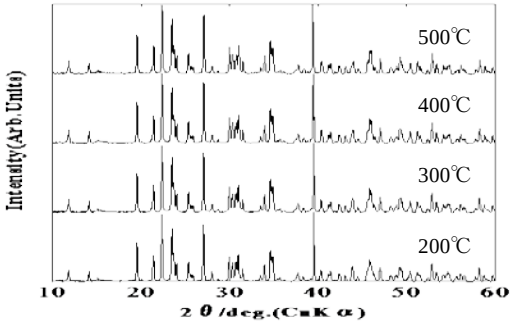

Fig. 3. Variation of in-situ XRD patterns for $Zr_2(WO_4)(PO_4)_2$ at the given temperatures.

Content:

The research work is developments of advanced inorganic materials such as negative thermal expansion materials (Fig. 1) or thermoelectric materials (Fig.2) made of oxides which is low in price, harmless and stable from physical and chemical viewpoint. X-ray diffraction (XRD) techniques are also used in materials characterization in our lab (Fig. 3). Crystal structure of materials has a close connection with its properties.

Negative thermal expansion oxide have a range of potential engineering, photonic, electronic, and structural applications. If a negative thermal expansion material is mixed with a "normal" material which expands on heating, it could be possible to make a zero expansion composite material.

Today, some alloys are in practical use as thermoelectric materials. However, Perovskite-type materials are more stable in high temperature region. In our lab., it was found that some cation-doping oxides had higher values than non-doped materials in thermoelectric properties.

Crystal structures of materials above mentioned are investigated by XRD and Rietvelt analysis.

Keywords：Advanced Materials, Crystallography

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