T15-104

Tohoku University's Invention

Oxide ceramics – carbon composite and its manufacturing process

Manufacturing $Li_4Ti_5O_{12}$-carbon composite by using microwave at low cost!

Summary

Ceramics – carbon composite having multi-function is developed in the recent years. However, the composite is heated at high temperature for a long time during the manufacturing process so the particles are sintering between them and the Li4Ti5O12 nano particles able to generate high power cannot be obtained. Moreover, the synthesis method is complex and uses expensive raw materials so the manufacturing cost is high.

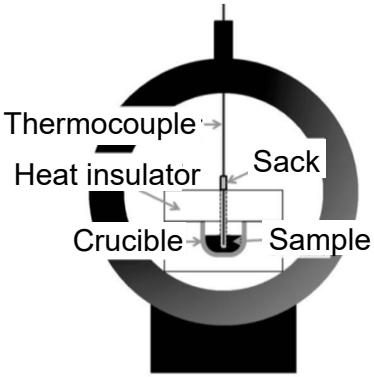
This invention can provide oxide ceramics – carbon composite and its manufacturing process with reduced cost. This invention manufacturing process is to mix raw material of oxide ceramics made by LiO2 and TiO2 with carbon and fire with microwave in order to create Li4Ti5O12 carbon composite. As result, Li4Ti5O12 crystalline particle which is an oxide ceramics having particle diameter lower than 250nm; and oxide ceramics – carbon composite having above mentionned carbon bond on the crystal plane (111) and (200) of the oxide ceramics – carbon composite were obtained.

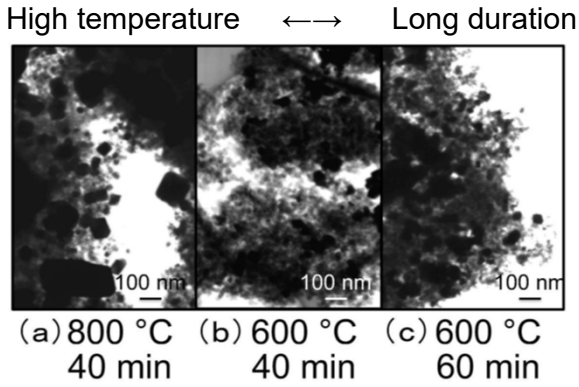
Effect

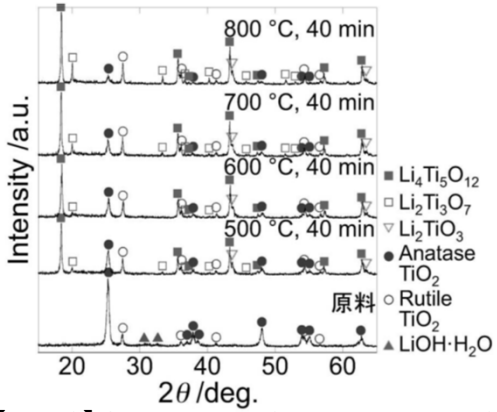
Manufacturing oxide ceramics carbon composite at low cost

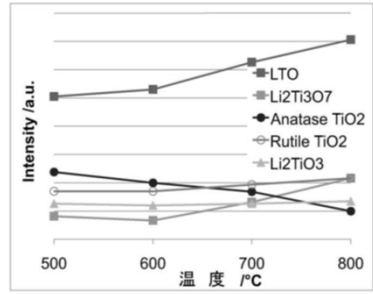
Application

- Electric conductive, heat resistant, corrosion-resistant, heat conductive, anti-heat shock material
- New function material development









【Up left】Section view of the heating manufacturing process using microwave
【Up right】FE-SEM picture of this invention manufactured by different temperature and duration of heating
【Down left】XRD pattern of X-ray diffraction results of this invention manufactured using above condition
【Down right】1st peak intensity evolution of the XRD pattern component of this invention manufactured using above condition

Patent Data Sheet

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