

Project Title

Development of the Design and Fabrication Technology of Custom-made Electrical high Temperature Systems

Contributors: Khajeh Nasir Toosi
University of Technology, Exciton Co. Ltd.,
Hezare Sevom Co. Ltd.

Third Winner

Applied Research



Researcher:

F. Hossein-Babaei (PhD, DIC)

Abstract

Electrical high temperature systems (EHTS) are required for almost every materials-related R and D work. The goal was to develop the design and fabrication technology of such systems locally. Imported systems were expensive, and lacked the vital after-sale services. Major outcomes of the project are as follows: Mass production of 1100 °C (1982), 1250 °C (1985), 1500 °C (1986), atmosphere controlled (1999) and 1700 °C (2003) electrical laboratory furnaces for the first time in The Middle East; fabrication of Al₂O₃-SiC composites of different electrical and thermal properties (1995); mass production of EHTS equipped with muffles, element holders, tubes and linings made of Al₂O₃-SiC composites of different microstructures, for the first time (1996); design and fabrication of custom made EHTS for technically intricate pilot plants; novel designs for rotating-retort furnace, aluminium alloy solution-aging system, fibre-reinforced-polymer preheating system, thermocouple calibration unit, multi-zone high temperature gas phase chemical reactor and hydrogen atmosphere powder metal sintering furnace; and a novel concept (patented) for selective sensing of hydrogen at the presence of other reducing gases. Currently, we are able to design and fabricate practically any feasible electrical high temperature system, and we own the technology!