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CERAMIC ARE NEW MATERIALS FOR ENEGRY AND ENVIRONMENT CONSERVATION (A DISCUSSION)

Sadhna Goyal
Professor Dept. of Chemistry,Govt. M.V.M.Bhopal (M.P.) India

ABSTRACT
New and important materials plays an major role in achieving role in increased efficiency. The focus is on: Ceramic materials with a ceramic matrix with surface coating and heat insulation layers. New high temperature materials are expected to show better characteristics than conventional material. The development of ceramic structural material will be required for a significant increase of surface temperature to 1400°C. Surface coating used as heat insulation have a supplementary role in almost every high temperature material. Mainly compensating for corrosive conditions and accordingly with a stabilizing function. The main techniques used for sample measurement are Thermo Gravimetric Analysis (TGA) , Differential Scanning Calorimetry (DSC), Dynamic Mechanical Analysis (DMA). Bioceramics used as dental implants and synthetic bones.

Keywords-Energy, Conservation, TGA, DSC, DMA , Bioceramics

INTRODUCTION

Ceramics is an inorganic, non metallic solid prepared by the action of heat and subsequent cooling. Ceramics are structural bricks, pipes, floor and roof tiles. Refractories- kiln things, gas fire radiant's steel and glass making crucible. White waters including table ware, cook ware, pottery products. Technical is also known as engineering advanced special and in Japan fine ceramics such items include tiles used in space shuttle program, gas burner nossel, blastic protection, nuclear fuel, uranium oxide palates, biomedical implants, coating of jet engine, turbine blades, Ceramics disc break. Technical ceramics can also be classified into three distinct material categories: oxides- alumina ,ceria ,zirconia. Non oxides- carbide, boride, silicide. Composite materials – particular combination of oxides and non oxides.

DISCUSSION

Ceramic develop unique material property because ceramics tend to be crystalline. In the early 1980s Toyoto researched production of an adiabatic engine using ceramic components in the hot gas area. The ceramics would have allowed temperatures of over 3000°F. the expected advantages would have been lighter material and smaller cooling system leading a major weight reduction. The expected increase of fuel efficiency of the engine could not be verified experimentally, it was found that the heat transfer on the hot ceramic cylinder walls are higher than the transfer to a cooler metal wall as the cooler gas film on the metal surface work as a thermal insulator. Thus despite all of these desirable properties such engines have not succeeded in production because of cost for the ceramic components. High tech ceramic is used in watch making for producing watch cases. The material is valued by watch makers for its light weight, scratch resistance, durability and smooth touch. IWC is one of the brands that initiated the use of ceramic in watch making. Non crystalline ceramics are known as glass ceramics, widely used as cook-top and also as glass composite material for nuclear waste disposal. Work is being done in developing ceramics part for gas turbine engines. Turbine engines made with ceramics could operate more efficiently giving air craft greater range and less amount of fuel is required.

Such as dental implants and synthetic bones, hydroxyapatite, the natural mineral component of bone made synthetically from a number of biological and chemical sourced and can be formed into ceramic material. Orthopedic implants coated with these material bond readily to bone and other tissues in the body without rejection or inflammatory reactions so are of great interest gene delivery and tissue engineering. Most hydroxyapatite ceramics are very porous and lack mechanical strength and are used to coat metal orthopedic devices to aid informing a bond to bone or as bone filers. They are used as filers for orthopedic plastic srews to add in reducing the inflammation and increase absorption of these plastic materials. Work is being done to make strong fully dense nano crystalline hydroxyapatite ceramics material for the orthopedic weight bearing devices, replacing foreign metal and plastic orthopedic materials with a synthetic but naturally occurring bone mineral. Ultimately these ceramics material may be used as bone replacements or with the incorporation of protein collagens, synthetic bones.

REFRENCES

1. Ceramic tile and stone standard Ctioa.org.retrieved on 2011
2. B.K.Sharma industrial chemistry 2001
3. Greg Geiger introduction to ceramics American ceramic society
4. Ceramics in watch making watcher.infonioc.com 2008

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