

Preliminary Study on the Fabrication of Lithium Metatitanate Pebbles Using the Graphite Bed Process

Abstract

Lithium-based ceramics are considered promising tritium breeding materials for fusion reactor applications. Among various lithium-based ceramic compounds, lithium metatitanate has been chosen as the primary candidate for the Indian ceramic breeder concept. It is intended to be used in fusion reactors in the form of pebble beds, which consist of nearly spherical lithium metatitanate pebbles. At the Institute for Plasma Research, lithium metatitanate materials are being developed using the solid-state reaction process. Currently, the synthesized lithium metatitanate powder is shaped into spherical pebbles through extrusion-spheronization and freeze granulation methods. Recently, as an alternative approach the graphite bed process for fabricating lithium metatitanate pebbles has been started at very initial stage. This method is simpler with the potential of optimization leading to a continuous pebble fabrication process.

The objective of the project work:

1. Conduct a literature survey on the graphite bed process.
2. Fabrication of ~ 50 grams of lithium metatitanate pebbles using the graphite bed process.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: B.E./B.Tech. Mechanical Engineering

3) Academic Project duration:

(a) Total academic project duration: 10 Weeks

(b) Student's presence at IPR for academic project work: 3 Full working Days per week

**Email to: maulikpanchal@ipr.res.in[Guide's e-mail address] and
project_me@ipr.res.in [Academic Project Coordinator's e-mail address]**

Phone Number: 079 -2301 [Guide's phone number]