

Annex 17

Advanced thermal energy storage through phase change materials and chemical reactions - feasibility studies and demonstration projects

Title of the project Thermal Protection for Crystals using Molecular Alloys

Keywords (max 3 words) phase change materials, thermal protection, protein crystals

Contact person: Name: **Miquel Àngel Cuevas-Diarte**
Address: **c/ Martí i Franqués s/n; 08028 Barcelona, Spain**
Phone : **93.402.13.50** **Fax :** **93.402.13.40** **e-mail :** **mangel@geo.ub.es**

Institutions involved / Industry collaboration: **Universitat de Barcelona**
Université Bordeaux I
Utrecht University
Laboratorio de Estudios
Cristalográficos de Granada

Type of project:
(mark the appropriate) Demonstration project
 feasibility study
 experimental work
 simulation study
other (specify):

Purpose (max 100 words)

thermal protection of protein crystals during transport

Budget (including: governmental grant / industry collaboration / manwork / rental of room and utilities)

Summary (max 250 words, you may include pictures)

We propose the design, construction and test of a prototype using molecular alloys as phase change materials. These materials will act as a thermal protection from the environment. The protein crystals obtained in space laboratory need to be distributed to the characterization instalations in several countrys. The protein crystals will remain under a fixed range of temperature during a certain time depending on the alloy used and its quantity. We will use molecular alloys with a high latent heat of melting in a double wall of the transportation box. The melted alloy will store all the supply of frigories from the environment during its crystallization. During this process, the temperature inside of the box remains practically constant. The crystallization can be cyclic if we melt the alloy again. We will formulate and characterize the alloy to be used, and search materials of low cost. We will also design and construct the prototype, and determine its mechanical behaviour. Finally, will test the prototype in real conditions of use.

Economical evaluation

