Annex 17

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

Title of the project	**Molecular Alloys Phase Change Material and solid state miscibility in the fatty acid systems**
Keywords (max 3 words)	**molecular alloys, phase change materials, thermal behavior**

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Institutions involved / Industry collaboration:	**- Université Bordeaux I - France** **- Universitat de Barcelona - Spain** **- Utrecht University - The Netherlands**

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

Purpose (max 100 words)

Caracterise the thermal behavior of fatty acid mixtures.
Select the compositions which can give high performance MAPCM
Phase diagrams determination

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

Summary (max 250 words, you may include pictures)

Fatty acids ($C_nH_{2n}O_2$) have been already proposed as PCM for latent heat storage because of their high enthalpy of melting. Despite the material concerned by the applications are mixtures and not pure components very few research has been done on the solid state miscibility between fatty acids. We intend to study series of binary systems (implying fatty acids with chain length differences equal to 1, 2 ,3 or 4) and to determine the TX (temperature - composition) phase diagrams. This work will permit to select new molecular alloys with precise range of storage and corollary to enrich the diversity of MCP. The knowledge of the phase diagram is essential to understand the thermal behaviour of the mixtures during the melting –crystallisation cycles.

Economical evaluation