POST-INDUSTRIAL CERAMICS COMPATIBILITY WITH HEAT TRANSFER FLUIDS FOR LOW-COST THERMAL ENERGY STORAGE APPLICATIONS IN CSP

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ABSTRACT
This paper investigates the possibility of using a post-industrial ceramic commercially called Cofalit as a promising, sustainable, and inexpensive ($10/ton) thermal energy storage material. This ceramic presents relevant properties to store thermal energy by means of sensible heat in the temperature range of concentrated solar power (CSP) plants from ambient temperature up to 1100 °C. In the present study, the compatibility of this ceramic was studied with two conventional heat transfer fluids: nitrate molten salts for medium-temperature applications (200 to 500 °C) and air for high-temperature applications (500 to 900 °C). The use of this ceramic in direct contact with the heat transfer fluid should significantly reduce the cost of thermal energy storage systems in CSP applications and help to achieve the U.S. Department of Energy’s SunShot Initiative cost targets.

ACKNOWLEDGEMENTS
The work at CIC Energigune was supported by the Department of Industry, Innovation, Commerce and Tourism of the Basque government through the funding of the ETORTEK CIC Energigune-2011 research program.

The work at the PROMES CNRS laboratory was supported by the French government through the funding of the ANR research programs: ANR SOLSTOCK MATEPRO (No. 07_187635) and ANR SESCO (No. ANR-09-STOCK-E-09-03).

The work at NREL was supported by the U.S. Department of Energy under Contract No. DE-AC36-08-G028308.

The authors want to acknowledge the INERTAM/EuroPLASMA Company (France) for providing samples of the Cofalit ceramic.