(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 450 010 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
06.03.2019 Bulletin 2019/10

(21) Application number: **17020586.8**

(22) Date of filing: **20.12.2017**

(51) Int Cl.:
B01J 13/04 *(2006.01)* ***C09K 5/06*** *(2006.01)*
C08K 3/28 *(2006.01)* ***F28D 20/02*** *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD TN

(30) Priority: **30.08.2017 RO 604**

(71) Applicant: **National Research-Development Institute for Non-ferrous and Rare Metals (IMNR)**
077145 Pantelimon (RO)

(72) Inventors:
- **PITICESCU, Radu Robert**
  Bucaresti, CP 011137 (RO)
- **ROMERO-SANCHEZ, Maria Dolores**
  Elda, Alicante (ES)
- **MOTOC, Adrian Mihail**
  Bucaresti, CP 062083 (RO)

(54) INORGANIC PHASE CHANGE MATERIALS BASED ON POTASSIUM NITRATE MICRO ENCAPSULATION PROCESS IN A NANOSTRUCTURED INORGANIC ZINC OXIDE SHELL WITH APPLICATION IN THERMAL ENERGY STORAGE

(57) The invention relates to micro-encapsulation process of inorganic phase change materials based on potassium nitrate in a nanostructured inorganic zinc oxide shell with applications in thermal energy storage at temperatures above 300 C.

The process according this invention is characterized by the fact that the nanostructured zinc oxide shell is precipitated with potassium hydroxide on the potassium nitrate particles which are dispersed in the alcohol solution of zinc nitrate at 9.0 pH., followed by solvo-thermal treatment in an autoclave for 2 hours at 200 ° C and 40 atm. argon pressure, followed by spray-drying process of the suspensions at an air temperature of about 200 ° C inside the spraying equipment and grain sizing in the range of 20-50 μm.

EP 3 450 010 A1