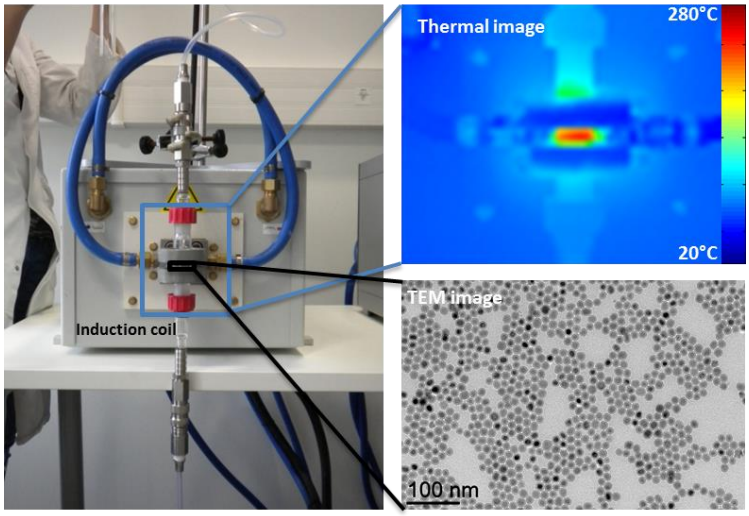
CHEMISTRY

Ferromagnetic nanoparticles for induction heating and their synthesis

Under oscillating magnetic field excitation, ferromagnetic nanoparticles undergo fast heating. However particles suffer from low capacity to convert electromagnetic energy into heat that hampers their wide use.

DESCRIPTION*

- 2 steps synthesis:
  - Synthesis of Iron nanoparticles
  - Carburization of nanoparticles
    - H_2/CO_2 atmosphere at 150°C
- Iron carbide nanoparticles with superior heating properties:
  - Specific absorption rate about 100 X state of the art particles



Photos: LPCNO.

TECHNICAL SPECIFICATIONS

Specific Absorption Rate	> 3 kW/g at 100 kHz, 47 mT
Material	Fe / C (Iron carbide)
Size	10 to 20 nm (Optimal at 15 +/- 2 nm)
Crystallography	$Fe_{2,2}C$ > 70 % mol

*Technology requiring license rights.

TOULOUSE TECH TRANSFER

COMPETITIVE ADVANTAGES

- Energy saving
- Material saving
- Instantaneous & local heating
- Permanent properties
- Scalable process
- Functionalizable
- Water-dispersible
- Non-toxic material

APPLICATIONS

- Material / Transport
  - Plastic welding
- Chemistry
  - Heterogeneous catalysis

INTELLECTUAL PROPERTY

- Patent pending

DEVELOPMENT STAGE

- Technology validated at lab level

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LABORATORY

- Nanostructures and Organometallic Chemistry group

LPCNO Laboratoire de Physique & Chimie des Nano-Objets

CONTACT

T. +33 (0)5 62 25 50 60
systemes@toulouse-tech-transfer.com
www.toulouse-tech-transfer.com