



Future NanoCYCLE project

7th PCRD – 2008/2011

Safety and sustainable development of nanomaterials during their all life cycle





Motivation & general objectives

- **Studies on nanotoxicology and environmental impact will take decades!**
 - ➔ **Proof that nanoparticles cannot escape from objects containing nanoparticles will faster the market introduction of "nano-inside" products**
- **Advanced new proposed materials have to present a high recycling-ability!**
 - ➔ **Demonstration of recycling both matrix and nanoparticles in some typical cases is a main issue for sustainable development**
- **Apprehending degradation of nanomaterials during their end of life is necessary for Environmental concerns!**
 - ➔ **Study of how typical released nanomaterial loose their nanoparticles under bacterial aggresion, UV effects, ..., and incineration.**

1. Particle release from nano products

- Set up of standardized methods able to measure particle release from nanomaterials
- Study of nanoparticle release in typical cases (abrasion, chocks):
Under which forms nanoparticles may be removed: agglomerated with matrix pieces, etc.?
 - . Soft polymers: nano SiO₂ in tyres, nanofillers in textile
 - . Hard polymers: CNT in epoxy
 - . Surface: Ag particles in SiO₂ sol/gel on glass, nanostructured surfaces
 - . etc.
- Understanding of nanoparticle hooking phenomena for optimization in plastics, metals, fibers, etc.

2. Nanoproduct recycling:

- Demonstration of nanoparticle and matrix recycling in some typical cases such as CNT in plastics.
- etc.

3. Waste disposal

- How nanoparticles are released from nanomaterial products submitted to UV, bacterial attack
- How they behave when lixiviated with rain: re-agglomeration rate
- In which form the nanofillers are emitted during an incineration process?
- etc.

Conclusion

- . **Expecting EC introduces this topic in next call (2008)**
- . **Looking for partners**
- . **Looking for complementary ideas**