

Photocatalytic TiO_2 -based coating on flexible materials for building applications - 1

Subject: Physico-chemical characterization of composite materials with photocatalytic properties (textiles and paper) and correlation with photocatalytic tests

Techniques: SEM-EDS, XPS, ToF-SIMS

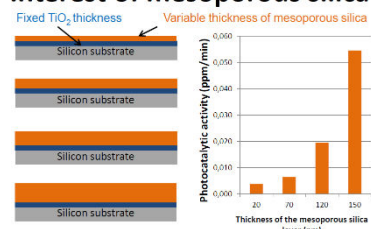
- ✓ Morphology and chemical composition of the surface
- ✓ Correlation of surface analyses with photocatalytic and photo-aging tests

Results:

Micrometric $\text{TiO}_2/\text{SiO}_2$ particles

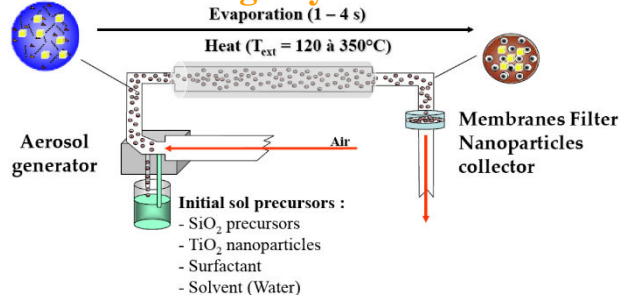
Proof of concept

Interest of mesoporous silica

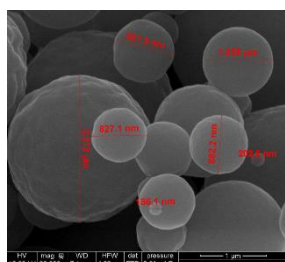


→ Mesoporous silica leads to the protection of the coating where particles are included without precluding the photocatalytic activity

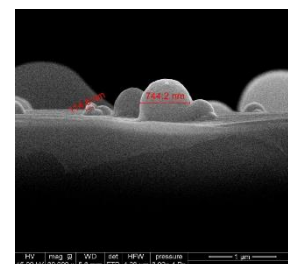
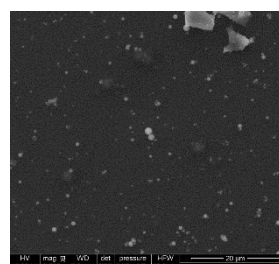
Sol-gel synthesis



Surface characterization



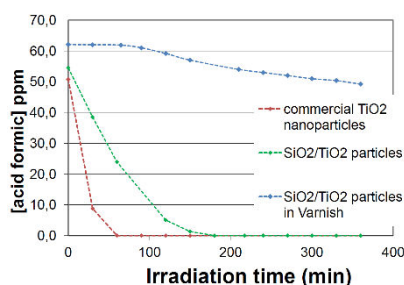
Integration
into varnish
(2.5 %wt)



SEM: particles are available at the surface

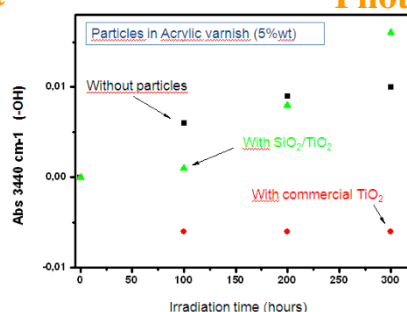
SEM: particles size from
100 nm to 3 μm

Photocatalytic test



rate of pollutant
degradation after
integration into the
varnish

Photo-aging



Without SiO_2
OH → loss of
material SiO_2
leads to
protection of
varnish

Conclusion:

Photocatalytic activity was demonstrated and the protection of the substrates from photoactivity of TiO_2 is highlighted by surface characterizations and photo-ageing tests.