Cross-Media Transport and Transformation of Carbonaceous Nanomaterials

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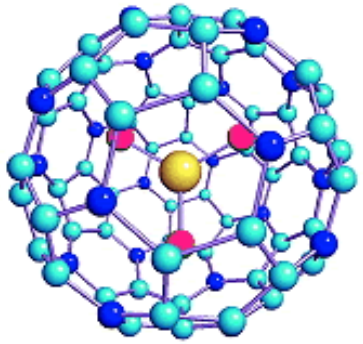

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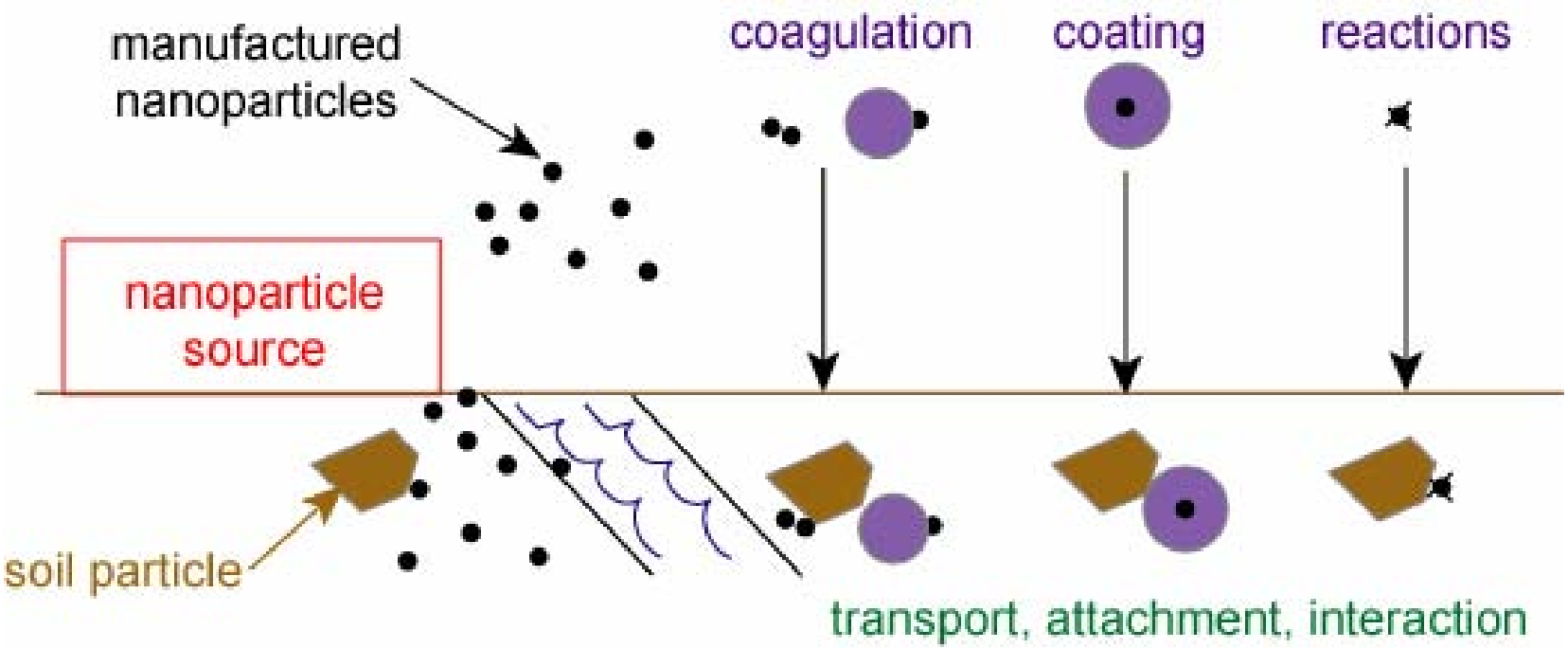
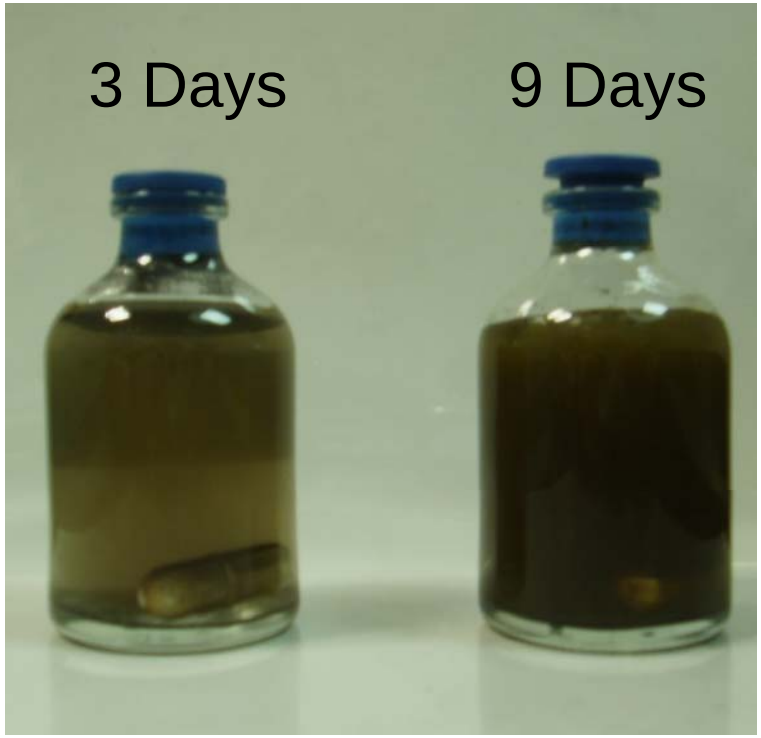
Objectives

- Characterize behavior of “fresh” versus atmospherically “aged” nanomaterials in aquatic and terrestrial systems



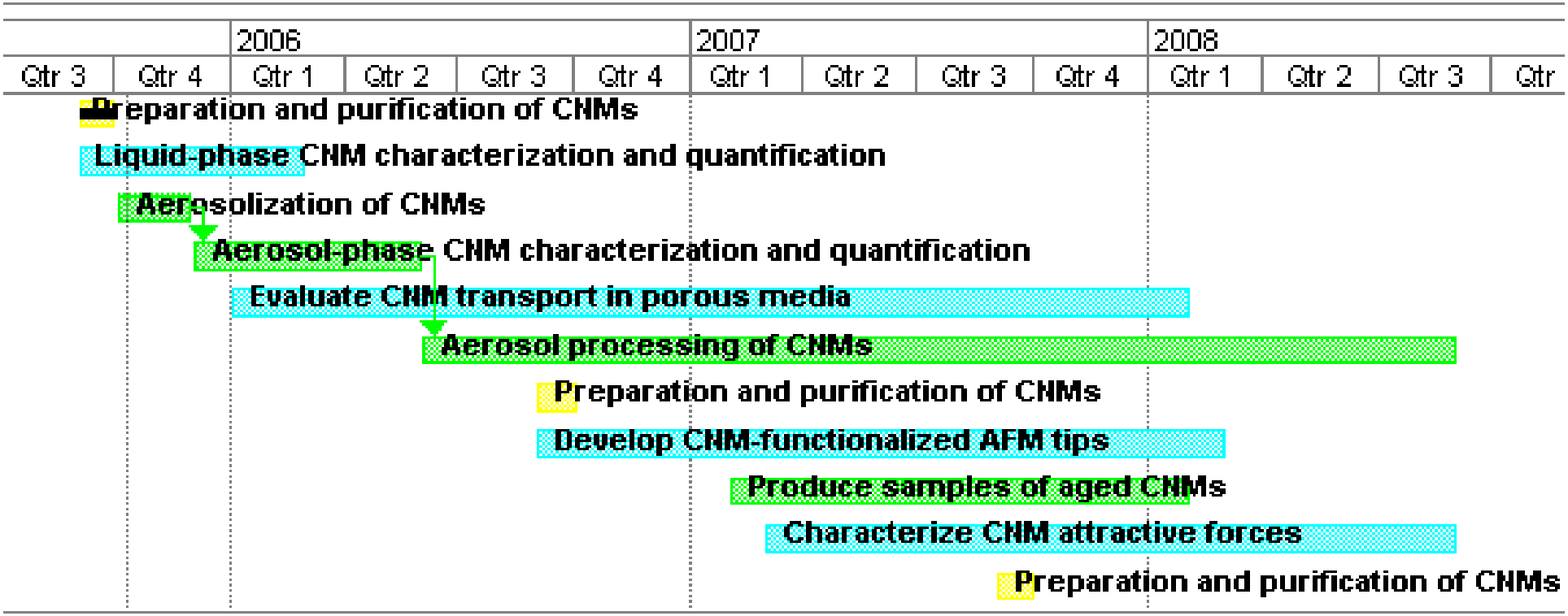
Approach

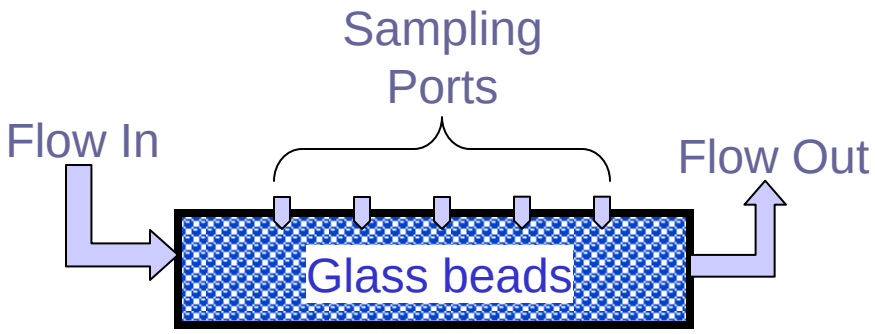


C_{60} in water

1) Quantify the rate of reaction of airborne CNMs with ozone
2) Age CNMs in smog chamber
3) Evaluate transport of “fresh” and atmospherically “aged” CNMs in porous media
4) Develop CNM-functionalized AFM tips
5) Quantify adhesive and repulsive forces between CNMs and environmental surfaces

Time Frame


2006
2007
2008
Qtr 3
Qtr 4
Qtr 1
Qtr 2
Qtr 3
Qtr 4
Qtr 1
Qtr 2
Qtr 3
Qtr 4
Qtr 1
Qtr 2
Qtr 3
Qtr
Preparation and purification of CNMs
Liquid-phase CNM characterization and quantification
Aerosolization of CNMs
Aerosol-phase CNM characterization and quantification
Evaluate CNM transport in porous media
Aerosol processing of CNMs
Preparation and purification of CNMs
Develop CNM-functionalized AFM tips
Produce samples of aged CNMs
Characterize CNM attractive forces
Preparation and purification of CNMs


Sampling
Ports
Flow In
Flow Out
Glass beads

Implications

- Prediction of fate of CNMs in environment
- Assess potential for human exposure
- Overcome barriers to adoption