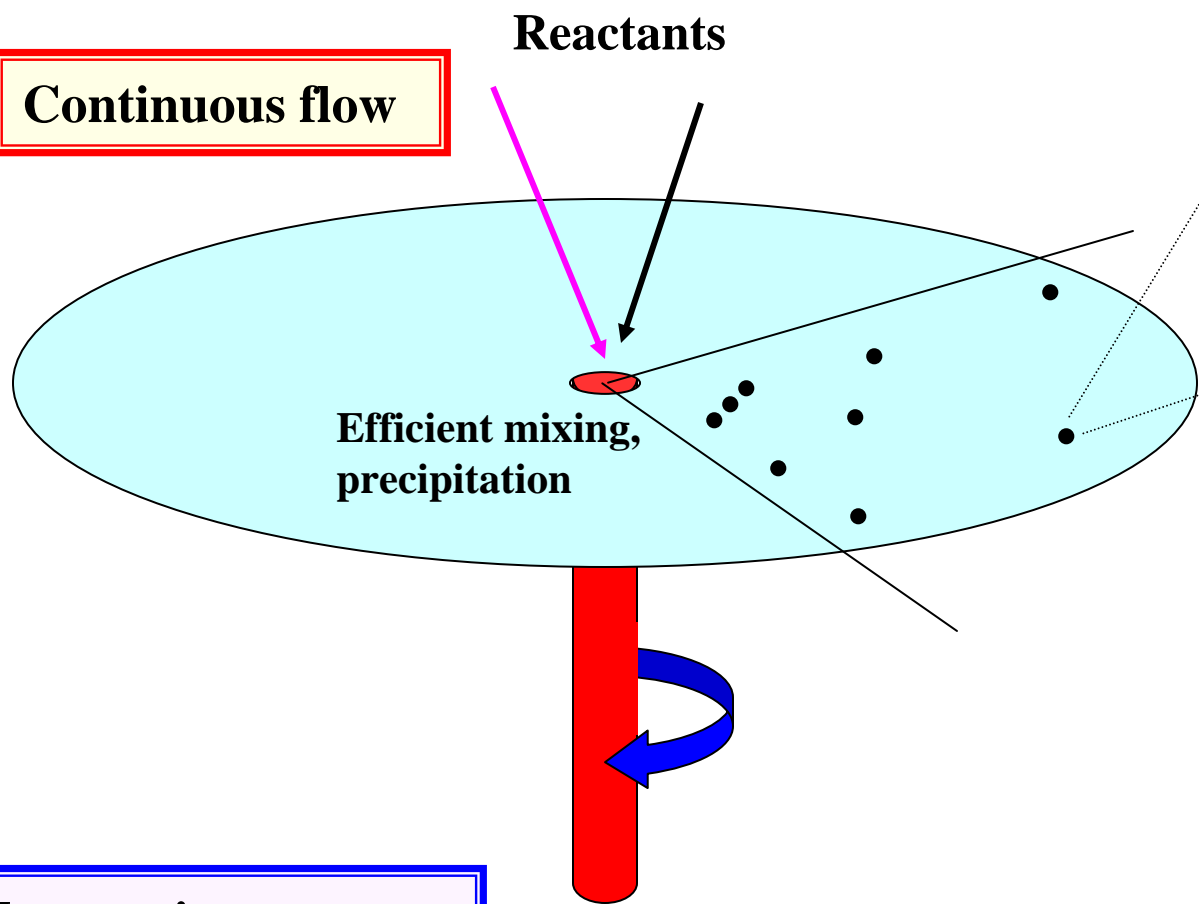




Spinning Disc Processing Nano-Particle synthesis

N. Anantachoke, M. Makha, C. L. Raston, V. Reutrakul, and N. C. Smith, *J. Am. Chem. Soc.*, 2006, 128, 13847 - 13853

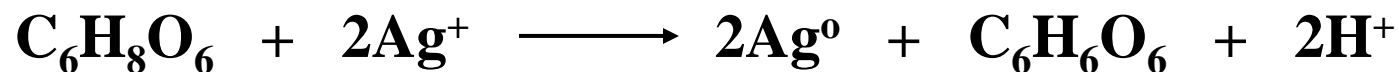
Continuous flow



Inorganics
Organics
Composites/Hybrids

Silver/Gold
Magnetic
**Drug Carriers/
Delivery Systems**
Semiconductors
Alloys/Hydrides
Fullerenes
Nano-tubes
Polymers

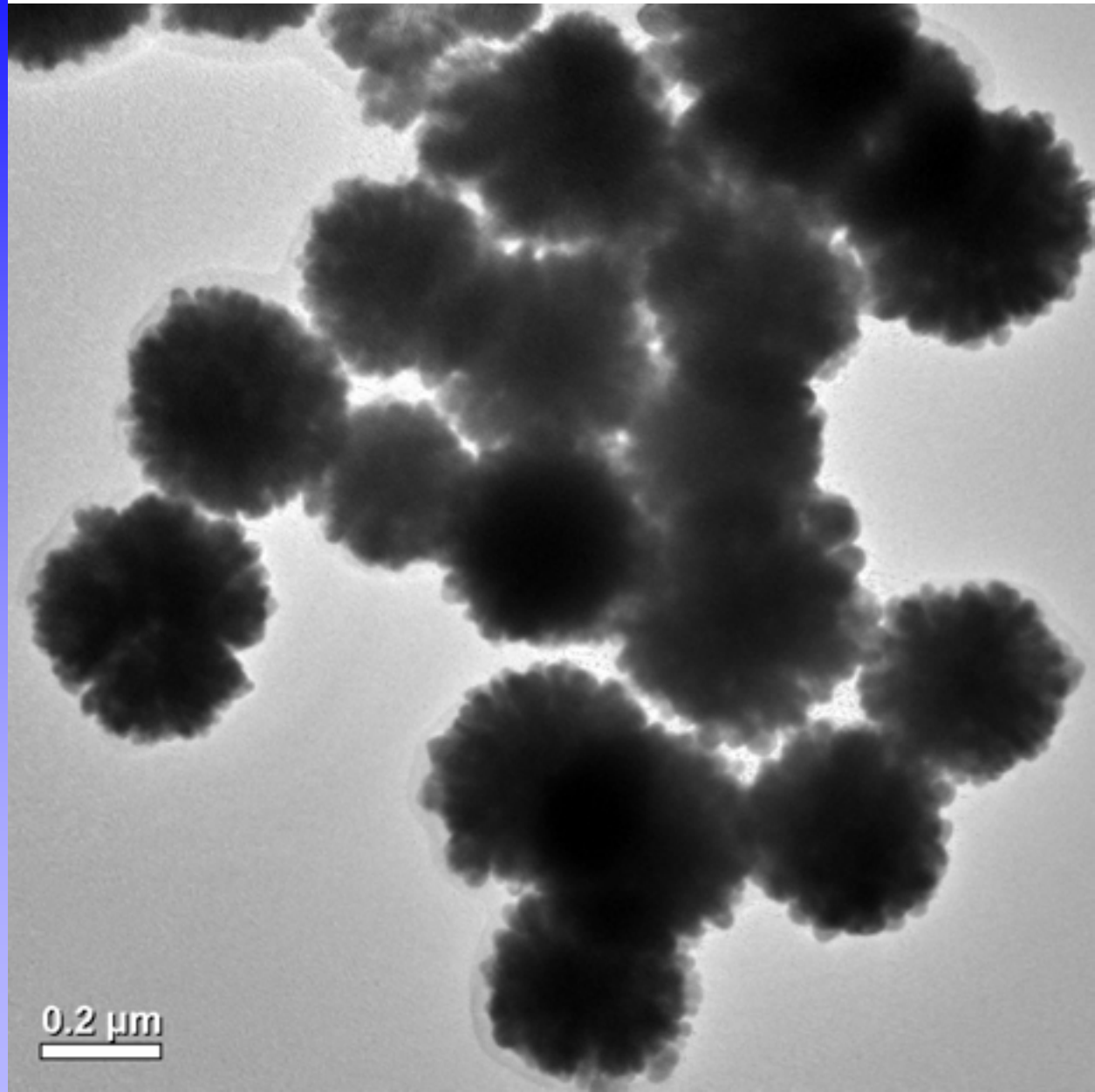
Fabrication of silver nano-particles



- ✓ Silver Nitrate; Ascorbic Acid; Soluble Starch.
- ✓ Room temperature synthesis.
- ✓ Water medium
- ✓ Control size and shape by changing concentration, pH and disc speed (SDP).

Use of starch as a stabilizer:

- Easily integrated into systems for pharmaceutical and biomedical applications.
- Stabilization is easily reversible at elevated temperatures relative to thiol based stabilizers.



Green Chemistry

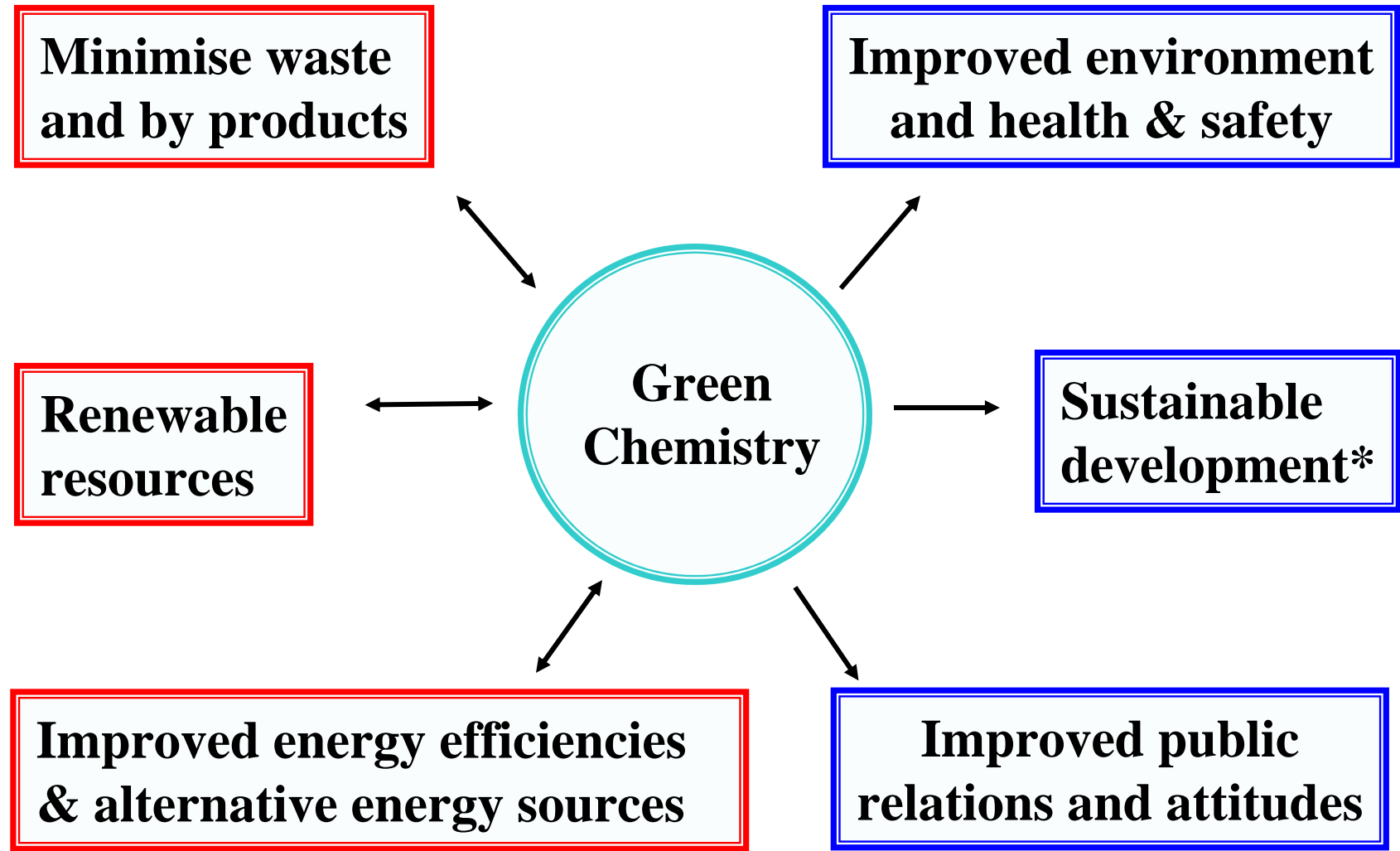
‘Chemical processes that reduce or eliminate the use or generation of hazardous substances in the design, manufacture and use of chemical products.’

BENIGN BY DESIGN

Towards a Sustainable Trajectory

Incorporate sustainability metric at
the inception of the science

Source: P. Anastas and T. Williamson, Green Chemistry, Frontiers in Benign Chemical Synthesis and Processes, Oxford Press 1998: P. Anastas, Meeting the challenges of sustainability through Green Chemistry, Green Chemistry, 2003, 5, G29



* 'meeting the needs of the present without compromising the ability of future generations to meet their own needs' [1987 UN Commission on Environment and Development]