Epoxyaconitic Acid as Prospective Capping Ligand for Magnetite Nanoparticles: Synthesis and Complexation with Magnetite

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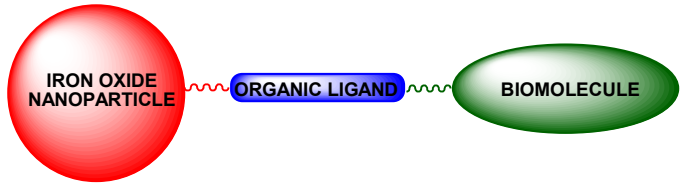
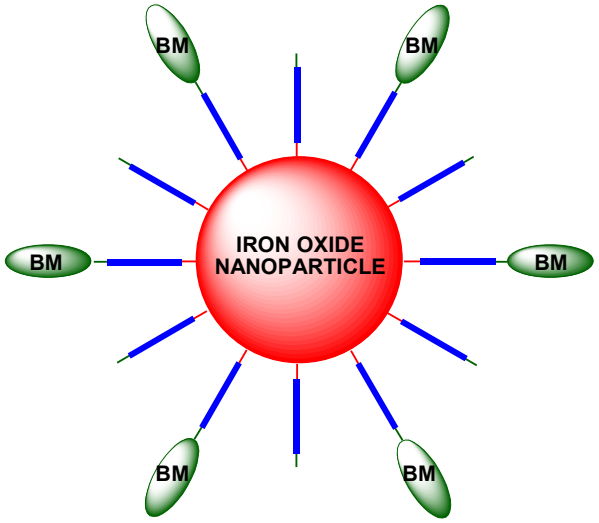
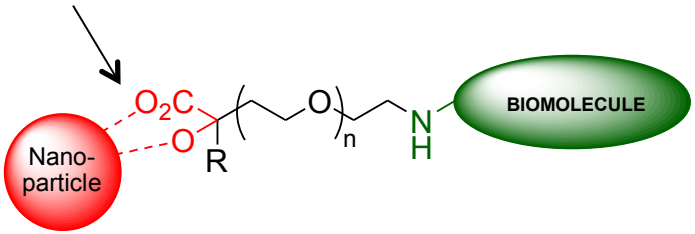
Background

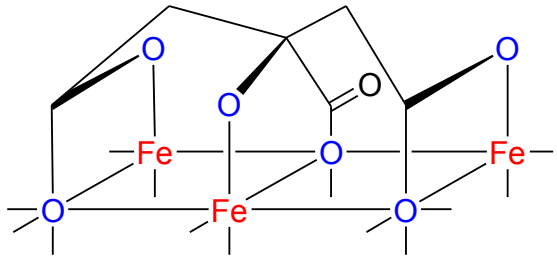
- MRI contrast and drug delivery agents
- Iron oxide nanoparticles
- Organic ligand





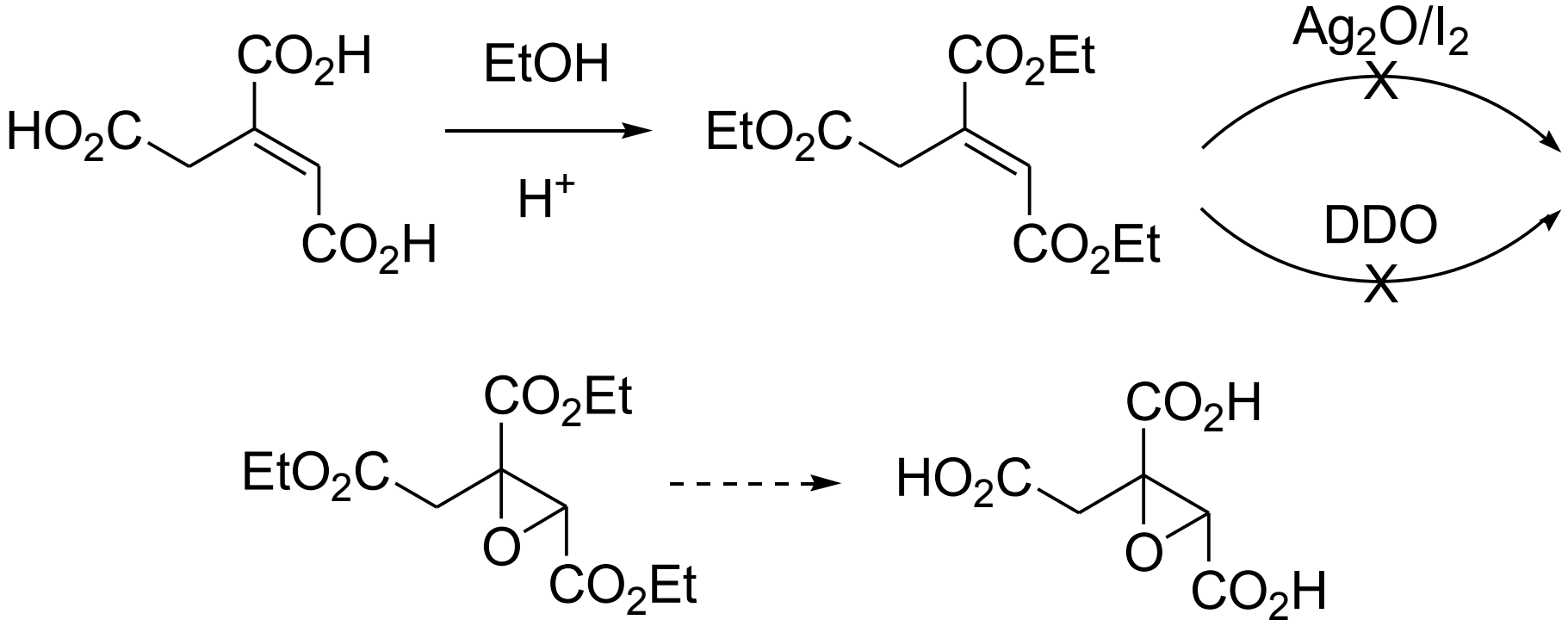
Poly α-hydroxycarboxilic acid



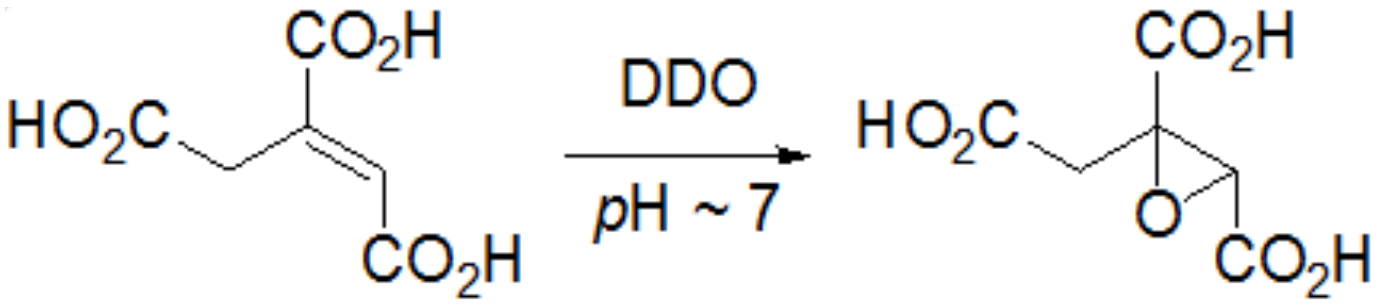


BINDING OF CITRIC ACID ON IRON OXIDE'S SURFACE

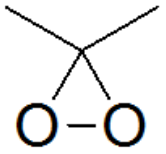
Synthetic Approach via Triethyl *trans*-Aconitate



Synthetic Approach via *trans*-Aconitic Acid



DDO:

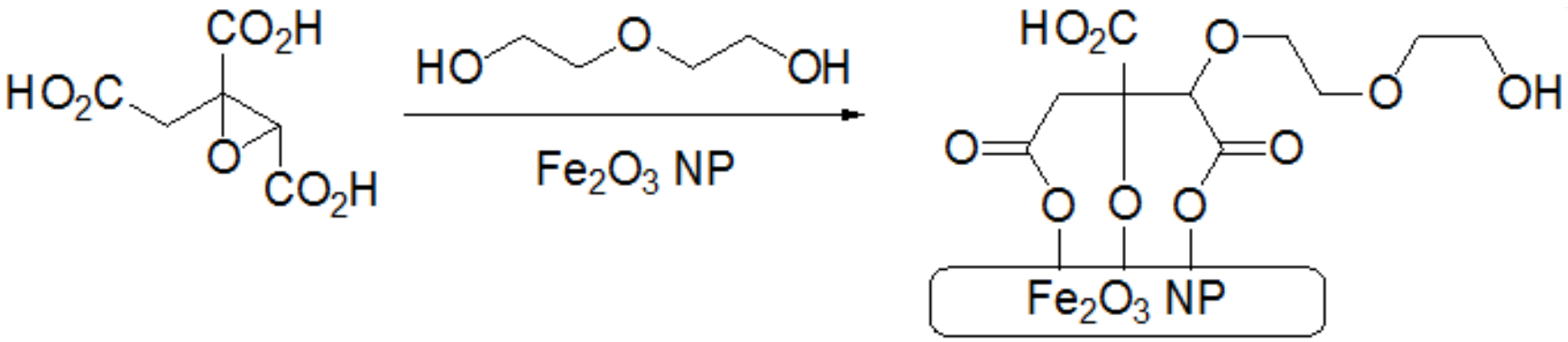


Magnetite Colloid Synthesis and Oxidation

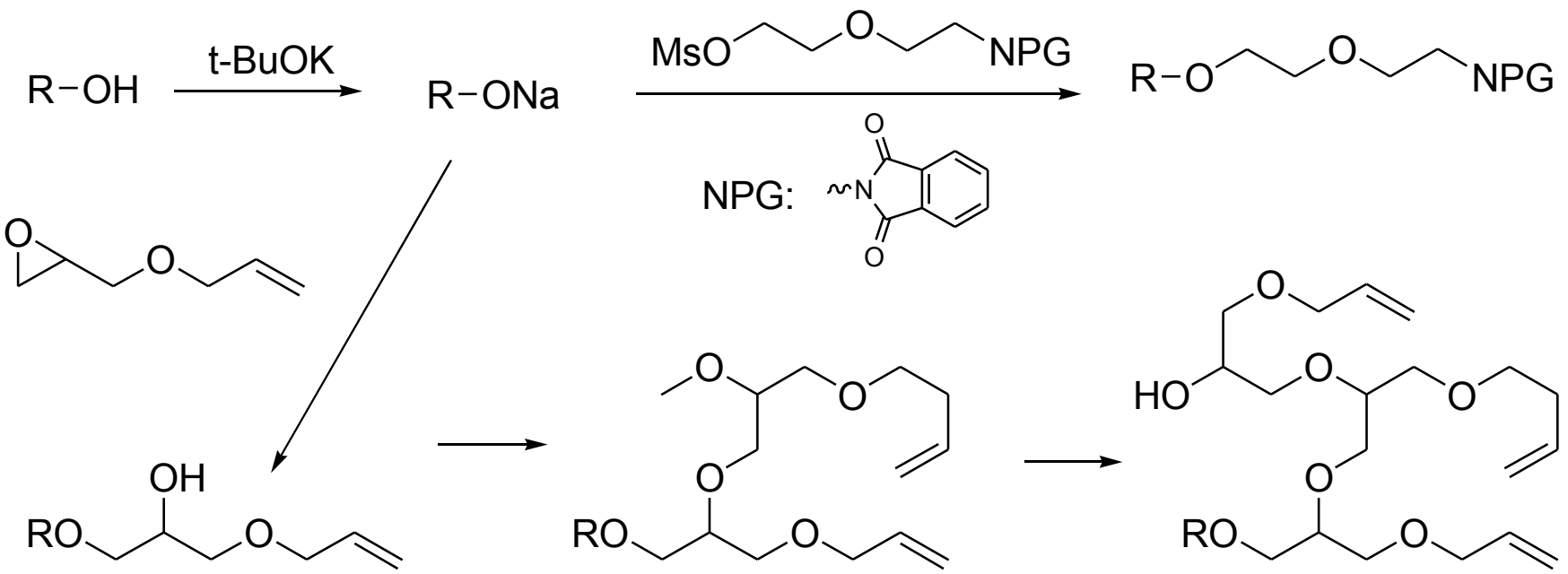
$$FeCl_2 + 2FeCl_3 + 8NaHDEG + 4H_2O \longrightarrow Fe_3O_4(H_2DEG) + 7H_2DEG + 8NaCl$$

$$2Fe_3O_4(H_2DEG) + O_2 \longrightarrow 2Fe_3O_4(HDEG) + H_2O$$

Complexation of Epoxyaconitic Acid with Magnetite



Future Work


R−OH
t-BuOK
R−ONa
MsO
O
NPG
R−O
O
NPG
NPG:
O
N
O
O
O
OH
RO
O
O
O
O
RO
O
O
HO
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O
O
RO
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Acknowledgements

Xavier University

La-SiGMA

NSF

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