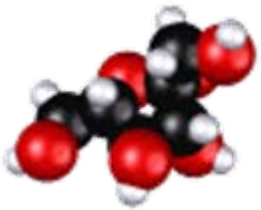
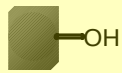
Research Highlight:

A Sweet Approach to Carbon Nanospheres

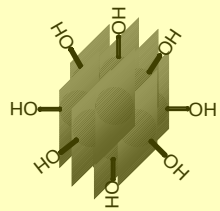
A remarkable chemical reaction based upon dehydration of aqueous sugar solutions (fructose corn syrup) generates uniform nanospheres of porous carbon in a few hours upon heating in a closed system (125°C, 3 atmospheres pressure).



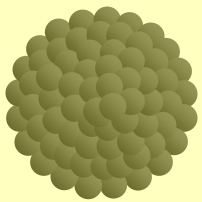
Small carbon sphere forms when sugar molecule $[C(H_2O)]_6$ loses water



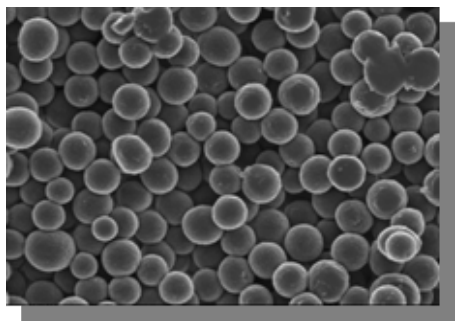
Evolving carbon segment of the molecule segregates from solution due to residual -OH on the surface



Further dehydration drives consolidation into larger, porous carbon structures



SEM micrograph showing 100 nm diameter spheres



These porous carbon nanospheres can serve as robust substrates for catalysis applications, as electrically conducting phases in fuel cells, for sequestration of contaminants and hostile agents and as an efficiently burning fuel source.