3. (10 pts) A disaccharide, C_{12}H_{22}O_{11}, exists in α and β forms which undergo mutarotation. It is hydrolyzed by enzymes known to cleave β linkages to give only D-(+)-glucose. Reaction of the disaccharide with Br\textsubscript{2} in H\textsubscript{2}O, followed by reaction with excess dimethyl sulfate and base gives an octa-O-methyl derivative A. Hydrolysis of A gives 2,3,4,6-tetra-O-methyl-D-glucose and 2,4,5,6-tetra-O-methyl-D-gluconic acid (the methylated mono-carboxylic acid of glucose). Draw the structure of both the disaccharide and A.

4. (15 pts) Explain (S&S) why electrophilic attack on furan gives more 2-substituted than 3-substituted product.

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