1. (16) Rofecoxib (Vioxx®) is a cyclooxygenase-2 inhibitor (COX-2 is the enzyme which mediates the body’s response to arthritis and other inflammatory conditions). Unfortunately, recent studies have indicated that Vioxx® can cause dramatic increases in blood pressure and is linked to a variety of heart malfunctions. *The molecule is also unusually acidic.* Loss of a proton, as shown below, affords a conjugate base (A) that immediately and irreversibly reacts with a number of biological methylating agents (CH₃-X, see reaction scheme below).

a) Explain why Rofecoxib is so much more acidic than typical hydrocarbons.
b) Draw arrows to show the flow of electrons in the reaction of A to B.
c) Why do you think the alkylation (think of an SN₂ reaction) occurs only on the oxygen and not at the site of proton removal (on the carbon)?
d) Draw the *exo* adduct that occurs when furan B reacts with propenal (you may replace the phenyl rings with “Ar”).