



**Figure 1.** Images of SiS ZnO treated tooth sample. Tooth was treated unbroken. *After* treatment the tooth was split in half, and from the split tooth sample the tip was broken off to reveal the interior of the tooth sample. a) Optical image indicating where tip was broken. b) SEM micrograph of broken tip and indication of imaged face for images c – f. c) Image of enamel – dentin interface at 250 X magnification. Scale bar is 100  $\mu\text{m}$ . d) Image of denting region at 2 KX magnification. Scale bar is 10  $\mu\text{m}$ . e) Image of dentin region at 5 KX magnification. Scale bar is 1  $\mu\text{m}$ . f) Image of dentin region at 10 KX magnification. Scale bar is 1  $\mu\text{m}$ .

- Use of the Center for Nanoscale Materials and the Advanced Photon Source, both Office of Science user facilities, was supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract No. DE-AC02-06CH11357. Additional funding by IARPA, (ARIADNE) under Contract D16P00002