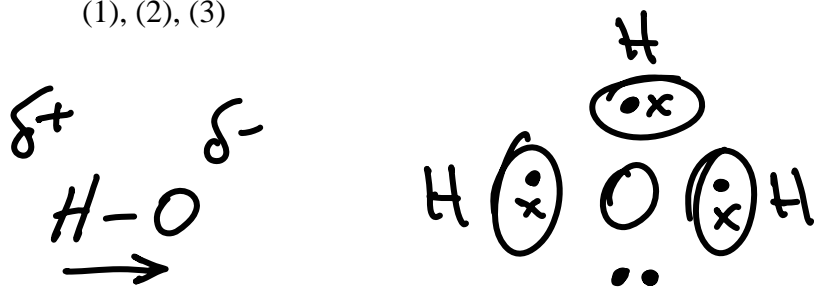# Homework Quiz #4A
Solution outline

Answer the following questions about the hydronium ion (H_3O^+).

(1) draw the Lewis structure

(2) circle all bonding orbitals

(3) indicate the polarity of the H – O bond

(4) state whether the molecule is polar or nonpolar

(5) calculate the bond energy of the H – O bond

Bond Energies (kJ/mol):   H – H 435;   O – O 140;   F–F 160;   C–C 350;

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H_3O^+

(1), (2), (3)

(4) molecule is polar

(5) use the Pauling formula to calculate bond energies

$$E_{H-O} = \sqrt{E_{H-H} \times E_{O-O}} + 96.3\,(\chi_H - \chi_O)^2 = \sqrt{435 \times 140} + 96.3\,(2.20 - 3.44)^2 = 395\,kJ/mol$$