Answers to Problem 82, Chemistry 301X - 2006

Compound (a) will show one signal in the ^{13}C NMR spectrum, (b) will show five, (c) four, and (d) will show three.

(e)The acid will show a broad OH stretch in the IR at 3200-2800 cm^{-1}. The aldehyde will show Henry's favorite pair of C-H stretching bands at 2900-2700 cm^{-1}.

(f) the cis (0°) coupling constant will be larger than the trans (~120°) coupling constant.

(g) the two hydrogens in the first compound are diastereotopic and will give two signals (an AB quartet). The methylene hydrogens in the second compound are equivalent, and will have the same chemical shift.