75 reveals that the angle $\Theta$ in the Heller-McConnell equation is the same for both pairs of $\alpha$-hydrogens (one pair above and one below the plane of the carbonyl system) in these conformations. In the conformation of Figure 10 all of the $\alpha$-hydrogens are equivalent and the observed spectrum should be a symmetrical pentet, possibly with smaller splitting by coupling with the $\beta$-hydrogens. In the conformation of Figure 7 the value of the angle $\Theta$ is different for the two pairs of $\alpha$-hydrogens above and below the carbonyl plane, and the observed spectrum would be expected to be a triplet of triplets split further by coupling to the $\beta$-hydrogens. Assuming that all of the possible lines are observed in the EPR spectrum of Figure 14, it is impossible to obtain a 48-line spectrum of the correct relative peak intensities by using only triplet splitting. In addition, it is interesting to examine the large hyperfine splitting constant of 7.5 gauss in light of the Heller-McConnell equation. For normal 9-, 10-, and 12-membered monocyclic semidiones, Russell and co-workers65 have found the carbonyl-carbon spin density $\rho_c$ to vary between 0.18 and 0.33. Substituting the observed hyperfine splitting constant of 7.5 gauss into the Heller-McConnell equation using 0.18 ($B = 58.5$) and 0.33 ($B = 40$) for the limits of $\rho_c$, the values of the dihedral angle $\Theta$ associated with this splitting are calculated to