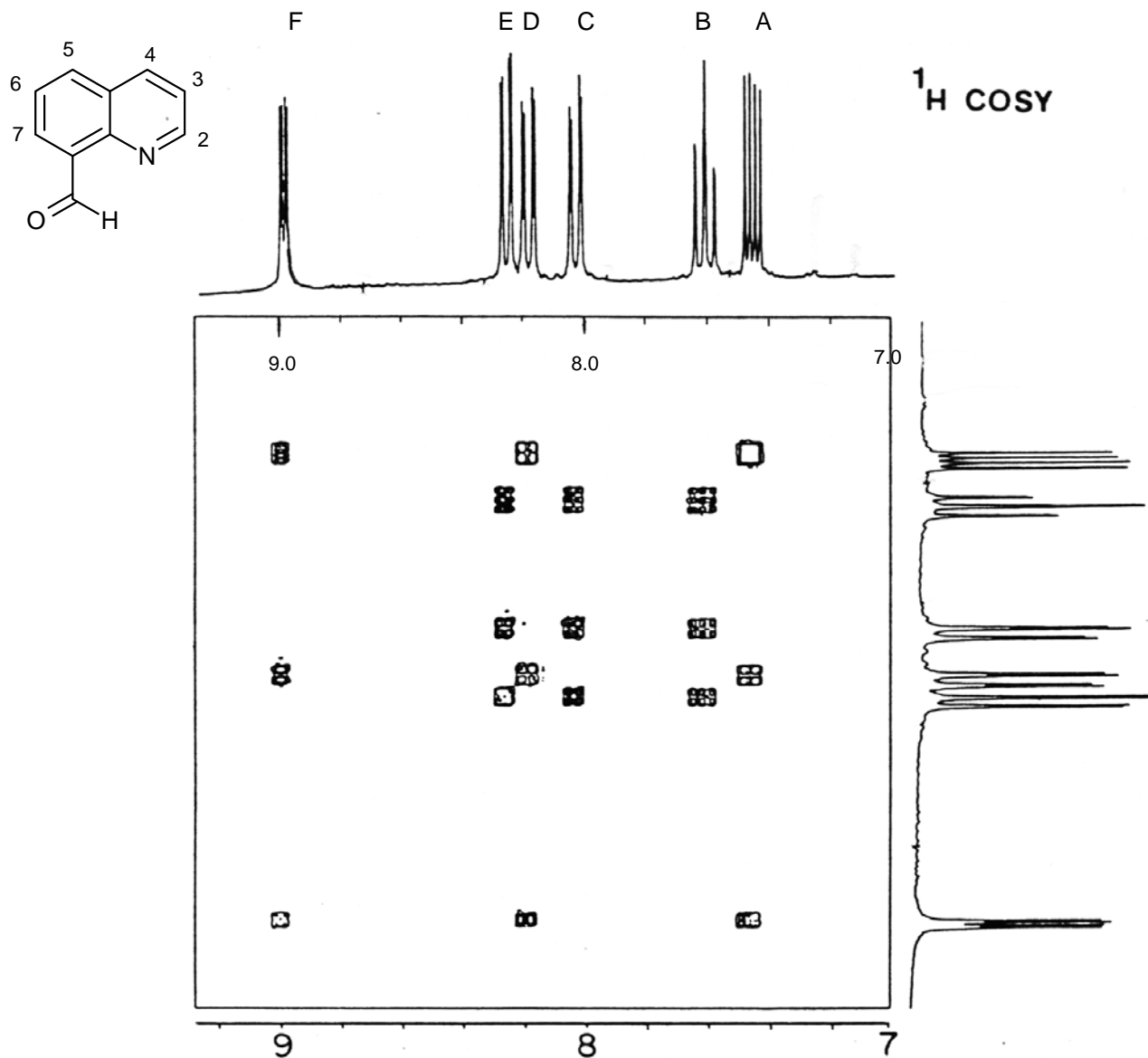


Problem R-090 ($C_{10}H_7NO$). Shown below is the 250 MHz proton homonuclear shift correlated spectrum (H,H -COSY) of quinoline 8-carboxaldehyde. The aldehyde proton at δ 9.5 is not shown (C. G. Anklin, P. S. Pregosin *Magn. Reson. Chem.* **1985**, 23, 672)



Assign the proton signals A through F to the protons H^2 to H^7 .

$H^2 =$ _____

$H^3 =$ _____

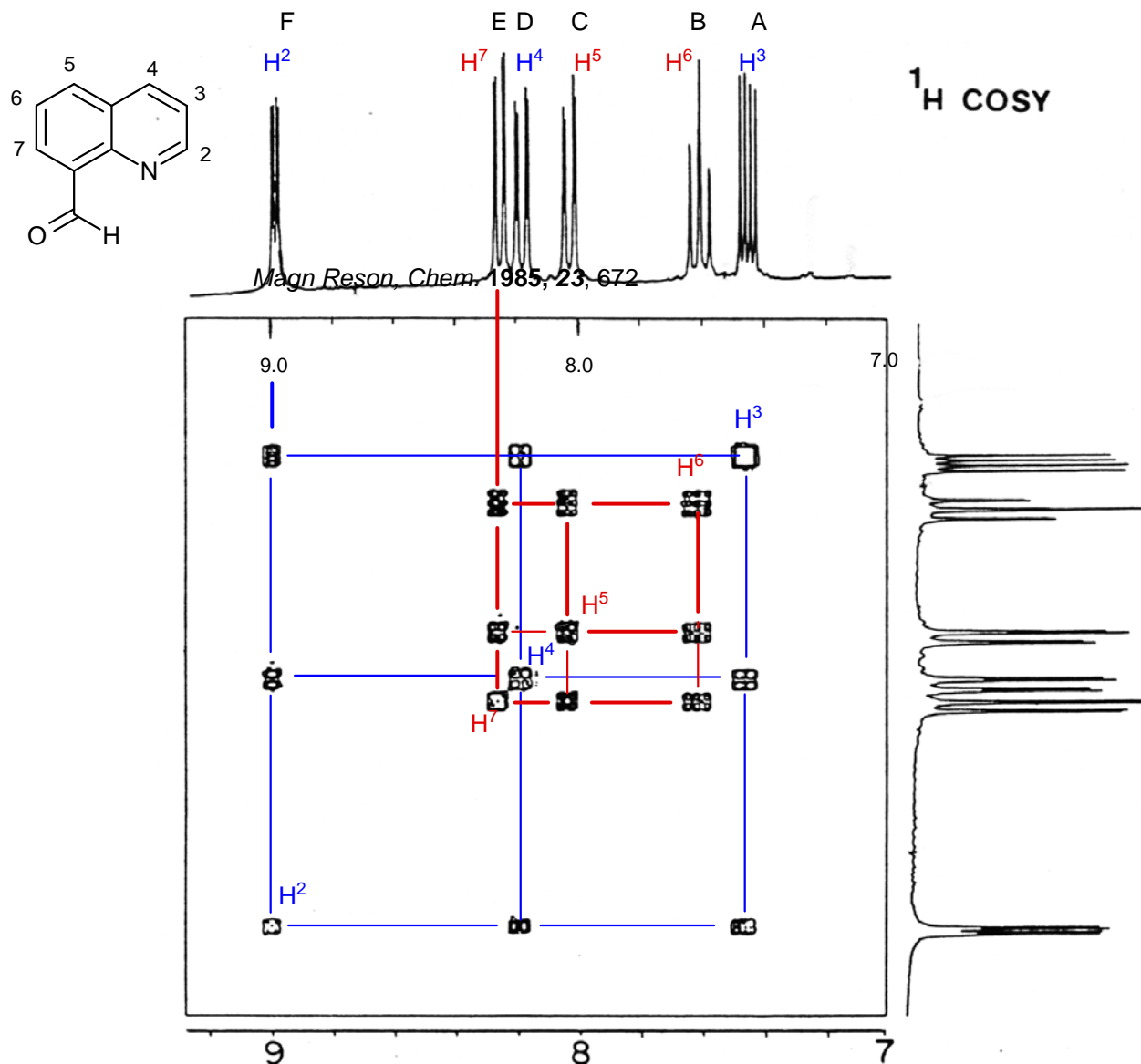
$H^4 =$ _____

$H^5 =$ _____

$H^6 =$ _____

$H^7 =$ _____

Problem R-090 ($C_{10}H_7NO$). Shown below is the 250 MHz proton homonuclear shift correlated spectrum (H,H -COSY) of quinoline 8-carboxaldehyde. The aldehyde proton at δ 9.5 is not shown (C. G. Anklin, P. S. Pregosin *Magn. Reson. Chem.* **1985**, 23, 672)



Assign the proton signals A through F to the protons H^2 to H^7 .

Magn Reson, Chem. **1985**, **23**, 672

$H^2 =$ F

H^2 can be assigned to F on the basis of chemical shift. It is correlated to A and D. A is a dd with two large couplings, so must be H^3 , and thus $D = H^4$

$H^3 =$ A

$H^4 =$ D

H^7 can be assigned to E on the basis of chemical shift (ortho shift of CHO larger than para shift). It is correlated to C and B. B is a triplet (two large couplings), so must be H^6 , and thus $C = H^5$

$H^5 =$ C

$H^6 =$ B

Magn. Reson. Chem 1985, 23, 672

$H^7 =$ E