

AP problem #4 Bonding, solution, weak acids

Methanoic acid has the formula HCOOH . Methanoic acid can be sprayed by some ants.

Methanoic acid is a weak acid.

A. Draw the Lewis structure of methanoic acid HCOOH .

B. Explain what features of methanoic acid make it soluble in water.

C. When dissolved in water, methanoic acid acts as a weak acid.

i. Write out the balanced net ionic equation for methanoic acid in water

ii. Draw the Lewis structure of the conjugate base of methanoic acid

iii. Identify the formal charges and oxidation numbers of each atom in both methanoic acid and its conjugate base.

iv. Comment on if the reaction shown in part i is a redox reaction based on your answer to part Ciii.

v. Draw a hydrogen bond using a water molecule and the formic acid molecule.

vi. Explain how the fact that pure methanoic acid does not conduct electricity but a dilute solution of it does.

vii. Explain why it is typical for methanoic acid to not fit behave like an ideal gas even under fairly standard conditions.