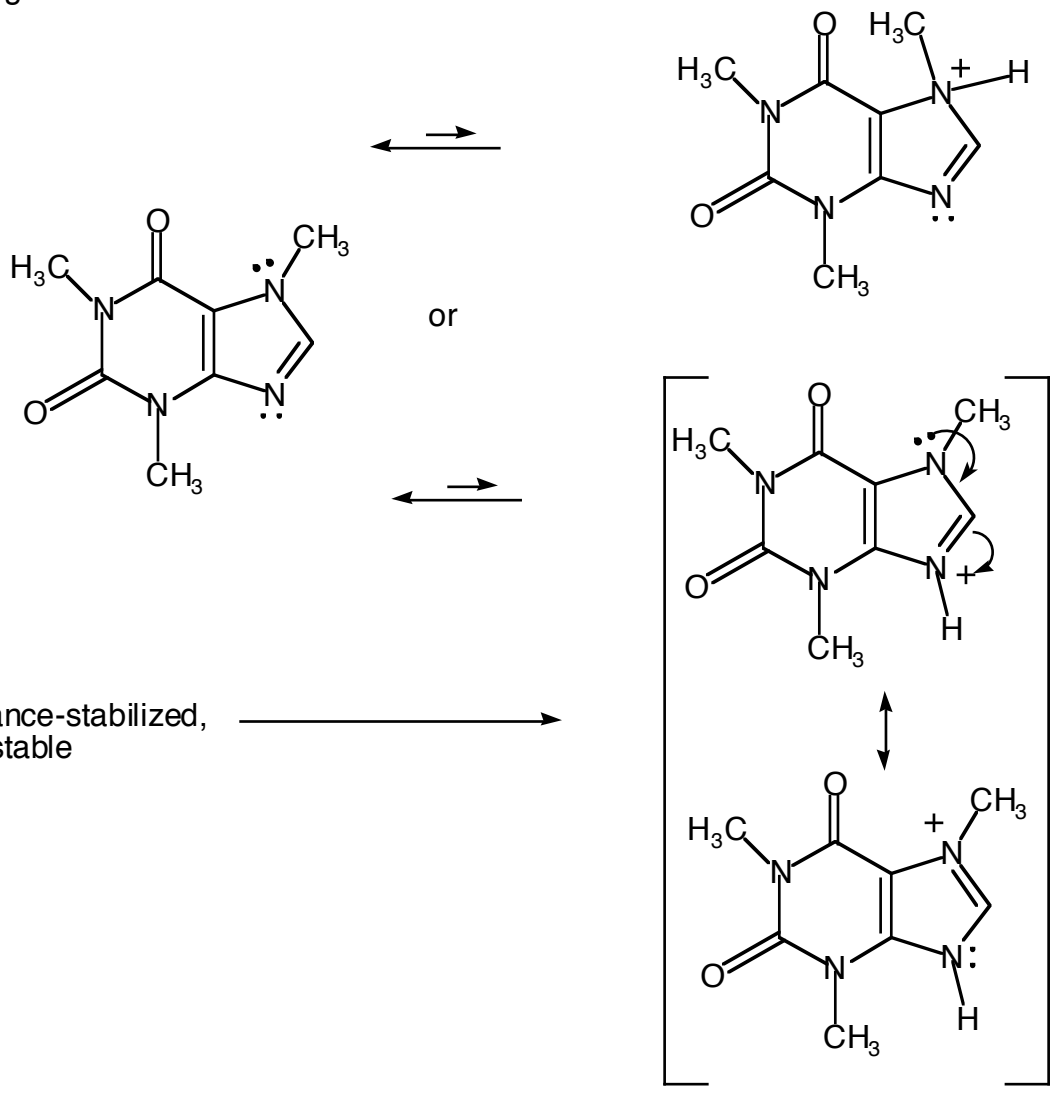
Answers to Problem 46, Chemistry 301X - 2006

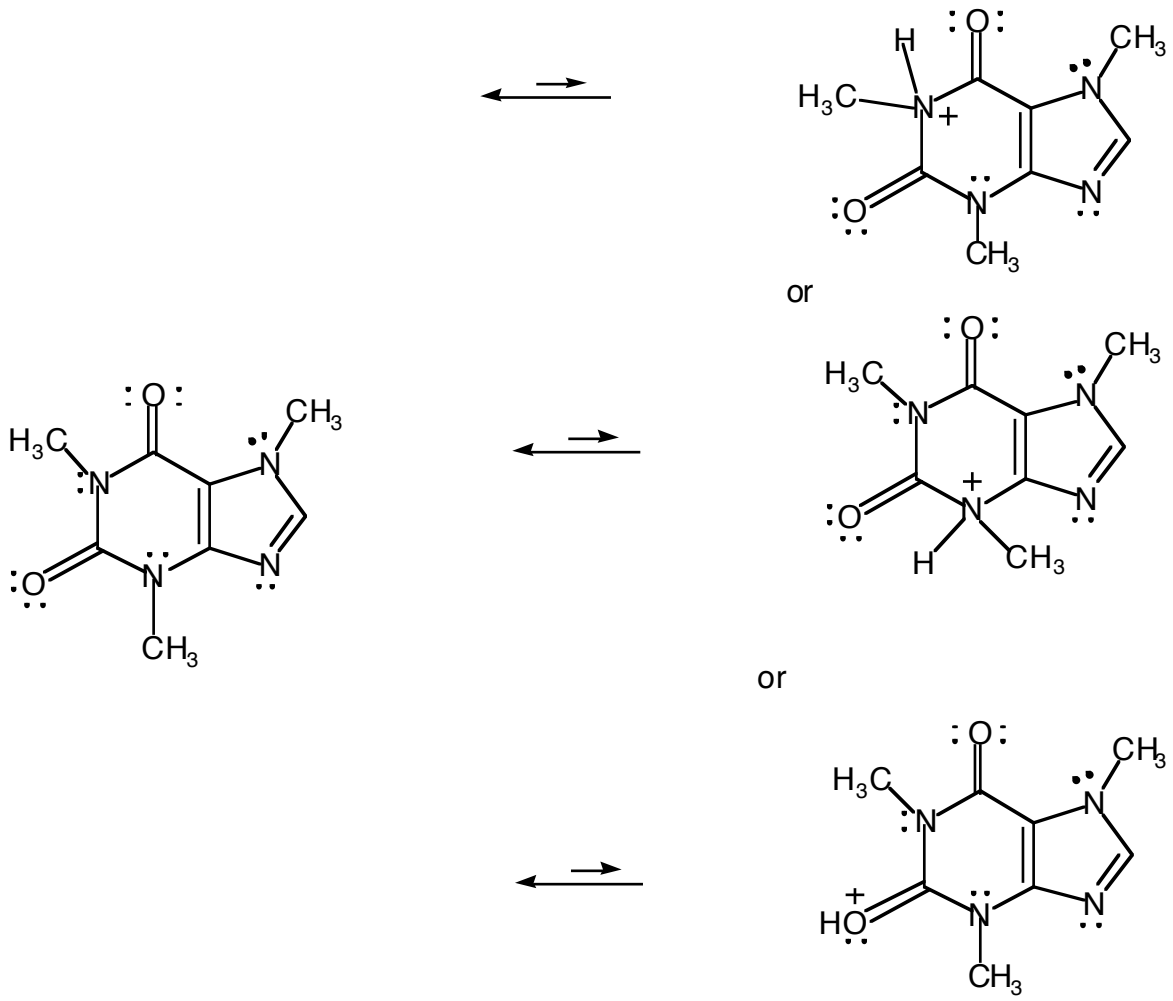
a) We'll tell you that it is one of the nitrogens in the five-membered ring that was protonated. Which one, and why?

It is all resonance. DRAW OUT BOTH POSSIBILITIES!!!!!!! Then think about it. Whenever the question involves the stability of an ion, "think resonance." Most of the time you will be on the right track.



b) If it had been the other ring that was protonated (it wasn't) would protonation be on N or O? Which one would it be, and why?

Part (b) has basically the same answer: protonation on oxygen leads to a resonance-stabilized intermediate, whereas protonation on N does not.



or

or

resonance-stabilized,
more stable --YOU DRAW THEM!