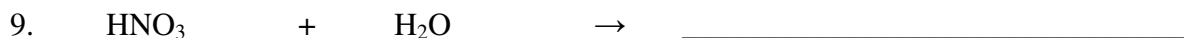
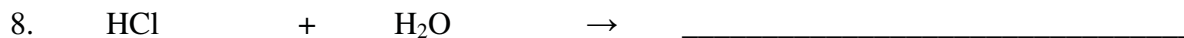
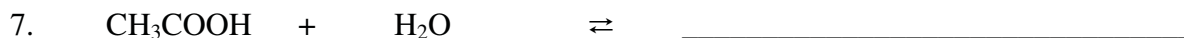
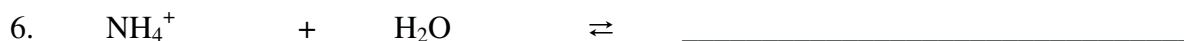
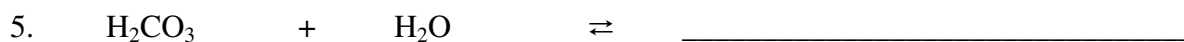
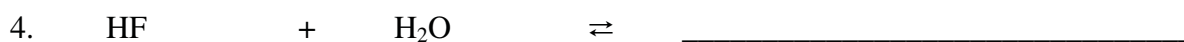
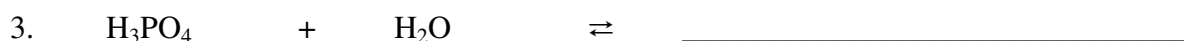
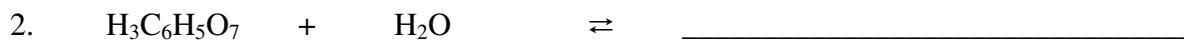
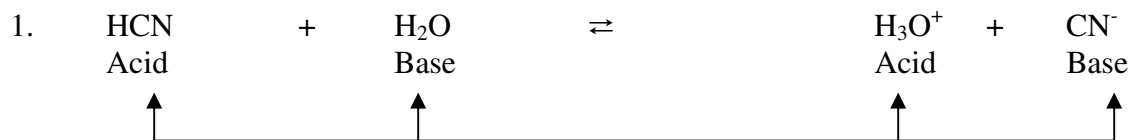


Problem Set # 2 Bronsted-Lowry Definition; Conjugate Acid-Base Pairs; Strong vs Concentrated

Complete each acid reaction. Label species as an acid or base. The first one is done for you. Also label each conjugate acid-base pair. What do you notice about each conjugate pair?



Write the equilibrium expression (K_a) for the *first seven* reactions shown on the previous page. These are written in the same manner as other equilibrium expressions, such as K_{eq} . Here, the subscript “a” stands for “acid”. The first one is done for you.

$$1A. \quad K_a = \frac{[H_3O^+][CN^-]}{[HCN]}$$

$$5A. \quad K_a =$$

$$2A. \quad K_a =$$

$$6A. \quad K_a =$$

$$3A. \quad K_a =$$

$$7A. \quad K_a =$$

$$4A. \quad K_a =$$

10. Which acids listed in reactions #1-9 are strong? _____

11. Define the term “strong acid”. _____

12. Why is it not possible to write an equilibrium expression for a strong acid? _____

13. Which acids listed in reactions #1-9 are weak? _____

14. Define the term “weak acid.” _____

15. Explain the difference between a strong and weak acid in terms of electrical conductivity and give an example.

For questions #16-25, complete the table given below.

	<u>Acid</u>	<u>Conjugate Base</u>		<u>Base</u>	<u>Conjugate Acid</u>
16.	HNO ₂	_____	17.	HCOO ⁻	_____
18.	HSO ₃ ⁻	_____	19.	IO ₃ ⁻	_____
20.	H ₂ O ₂	_____	21.	NH ₃	_____
22.	HS ⁻	_____	23.	CH ₃ COO ⁻	_____
24.	H ₂ O	_____	25.	H ₂ O	_____

Define the following terms:

26. Bronsted acid _____

27. Bronsted base _____

28. Arrhenius acid _____

29. Arrhenius base _____

30. List the strong acids.
31. Rank the acids in order of *decreasing* strength. HCl H₂S H₃PO₄ H₂CO₃ HF HSO₄⁻
32. What would you rather drink 1 M vinegar or 1 M hydrochloric acid? Explain.

(NOTE: This question is just conceptual in nature. At NO TIME, EVER, should you drink any of these liquids.)
33. Describe the difference between a *concentrated* and *dilute* acid. Describe their relative conductivities.
34. Describe the difference between a *strong* and *weak* acid. Use two examples and write equations to support your answer. Describe their relative conductivities.
35. Are there situations where a *weak* acid can have a similar conductivity to that of a *strong* acid? Explain.