



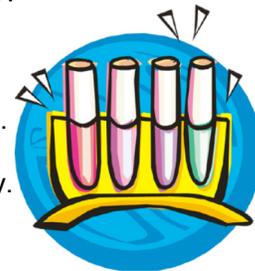
-SOLUTION CHEMISTRY: ACIDS, BASES & SALTS -

The Physical Science Series

Name _____ per. _____

Acids

1. List the name, formula and source of seven common acids. What element is found in all of these?
2. For a substance to be classified an acid it must: 1. ? 2. ? 3. ?
3. Name two substances that contain hydrogen but are not acids.
4. What holds an acid molecule together? Draw a model of hydrogen chloride showing e- and p+.
5. What happens to an acid when placed in water? Explain why this occurs and name the products.
6. What does ionize mean? Give an example.
7. What is meant by polar? Why is water a polar molecule? Draw a model of water showing polarity.
8. What is a hydronium ion? How does it form?
9. Write a chemical reaction for HCl ionizing in water producing hydronium ions.
10. Why are acids corrosive with many metals. List 5 metals that won't react with HCl.
11. List and briefly describe four properties of acids.



Naming Acids

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12. What is a binary acid? Give two examples.
13. How do you name binary acids?
14. What is a ternary acid? Give two examples.
15. How do you name ternary acids?
16. Name the following acids:

a. HBr

b. H₂SO₄

c. H₂SO₃

d. HF

e. HNO₃

Bases

17. a. List the name, formula and source of five common bases.
b. List the name & formula for the polyatomic ion found in all bases.
18. Bases make good cleaning solutions. Explain why.
19. What is a unit cell? A crystalline lattice? Draw a model of each.
20. a. What happens to a base when dissolved in water?
b. Why does this occur? c. What are the products?
21. How is dissociation different from ionization? How are they similar?
22. Write a chemical reaction for sodium hydroxide dissociating in water.
23. List and briefly describe six properties of bases.



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Salts

24. In the "old days" why was the salt sodium chloride so important? What is the Latin term for salt? What English word came from this term?
25. How did colonial Americans obtain salt? How is it obtained today?
26. What is the chemical definition of salt?
27. How do salts form? Give an example.
28. What two products are always produced in a neutralization reaction?
29. What acid and base would be required to produce the following salts:
a. calcium sulfate b. rubidium nitrate c. magnesium iodide d. lithium carbonate

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Acid/Base Indicators

30. What should you never do in the lab unless instructed by your teacher?
31. What is an indicator? Why are they used in the laboratory? Where do they come from?
32. What does red and blue litmus paper do in an acid? In a base?
33. What is an easy way to remember the results of a litmus test?
34. What does phenolphthalein do in an acid? In a base?



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Neutralization Reactions

35. What are the reactants and products in a neutralization reaction?
36. What does neutralized mean?
37. What type of chemical reaction is a neutralization reaction?
38. What is one product that is always formed in a neutralization reaction? What causes it to form?
39. What is the pH of the products in a neutralization reaction? Explain why.
40. Write equations for the four sample problems listed on the screen.

Call your teacher over for a stamp when finished.
(This counts as part of your grade - so be careful.)

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ACIDS, BASES & SALTS

Write a balanced equation for the following neutralization reactions:

- Nitric acid & sodium hydroxide _____
- Sulfuric acid & potassium hydroxide _____
- Phosphoric acid & ammonium hydroxide _____
- Carbonic acid & calcium hydroxide _____
- Hydrochloric acid & aluminum hydroxide _____
- Hydrofluoric acid & barium hydroxide _____

Fill in the table below with the missing formulas/names.

SALT	ACID	BASE
7. SrCl ₂	_____	_____
8. _____	HF	Fe(OH) ₂
9. Ba(NO ₃) ₂	_____	_____
10. Ammonium nitrate	_____	_____
11. _____	hydrofluoric acid	lithium hydroxide

Strong/Weak Acids & Bases

13. Strong acids ionize completely (100%) when dissolved in water. This means that every molecule of a strong acid breaks into a hydrogen ion (H⁺) and a cation. On the other hand, weak acids ionize less than 30% of the time - most molecules of a weak acid remain intact and do not ionize. Here is how you can identify strong and weak acids:

Strong binary acids contain a member of the halogen family (F, Cl, Br, I).

Strong ternary acids are those in which the oxygen outnumber the hydrogen by 2:1 or more.

Strong bases are those that contain an alkali or alkaline earth metal. Those that do not contain these metals are weak bases. Strong bases dissociate completely - the entire crystalline lattice breaks into individual ions. This means that strong bases are very soluble in water and produce hydroxide ions (OH⁻). Weak bases, which do not dissociate completely, are weak bases. Weak bases have a crystalline lattice that does not dissolve easily in water and remains intact.

Weak bases do not dissociate completely in water. Here is how to identify strong bases:

Strong bases contain a member of the Alkali or Alkaline Earth Metal family

Classify the following as *strong acid*, *weak acid*, *strong base*, *weak base*.

HF: _____	H ₂ CO ₃ _____	NaOH _____
Fe(OH) ₂ _____	H ₂ PO ₄ _____	Sr(OH) ₂ _____
H ₂ PO ₃ _____	HBr _____	Ba(OH) ₂ _____

- Write a balanced equation for the dissociation of magnesium hydroxide in water.
