

Ions

How are ions made from neutral atoms?

You have learned that not all atoms of an element are the same. Variation in the number of neutrons results in different isotopes of the element. In this activity we will explore another variation that can take place—the loss and gain of electrons. The exchange of electrons between atoms is a very common way for chemical change to take place. We will see it many times throughout the year.

1. Use Model 1 (on the next page) to complete the following table.

	Metal or Nonmetal?	Is the number of protons the same in the atom and the ion?	Is the number of neutrons the same in the atom and the ion?	Is the number of electrons the same in the atom and the ion?	Charge on the ion
Lithium	Metal	Yes	Yes	No	1+
Magnesium	Metal	Yes	Yes	No	2+
Aluminum	Metal	Yes	Yes	No	3+
Fluorine	Non-Metal	Yes	Yes	No	1-
Oxygen	nonmetal	Yes	Yes	No	2-
Nitrogen	non-metal	Yes	Yes	No	3-

2. Based on the table, what distinguishes a neutral atom from an ion?

a. neutral atom has the same amount of P^+ and E^-

3. Examine the isotope symbols in Model 1.

a) Where is the ion charge located in the isotope symbol?
the charge of an ion comes after the charge number

b) Is a charge indicated on the neutral atoms? If yes, where is it located?

A charge isn't indicated in neutral atoms b/c they don't have a charge and $P^+ - E^- = 0$.

4. Which subatomic particle carries a positive charge?

E^- , Mg , Al

5. Which subatomic particle carries a negative charge?

F , O , N

6. Propose a mathematical equation to calculate the charge on an ion from the number of protons and electrons in an ion. Confirm that your equation works using a positive ion example and a negative ion example from Model 1.

$$\begin{aligned} \text{Charge of an ion} &= \text{number of protons} - \text{number of electrons} \\ \text{Nitrogen} &= P^+ - E^- \\ &= 7 - 10 \\ &= -3 (3-) \end{aligned}$$

$$\begin{aligned} \text{Aluminum} &= P^+ - E^- \\ &= 13 - 10 \\ &= +3 (3+) \end{aligned}$$

Ions Pogil Answer Key Chemistry

Judd E. Hollander



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Class - XI Er. Meera Goyal, 2021-05-29 1 Basic Laboratory Techniques 1 To cut a glass tube or glass rod 2 To bend the glass rod at an angle 3 To draw a glass jet from a glass tube 4 To bore a cork and fit a glass tube into it Viva Voce 2 Characterisation and Purification of Chemical Substances 1 To determine the melting point of the given unknown organic compound and its identification simple laboratory technique Viva Voce 2 To determine the boiling point of a given liquid when available in small quantity simple laboratory method Viva Voce 3 To prepare crystals of pure potash alum $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$ from the given impure sample 4 To prepare the pure crystals of copper sulphate from the given crude sample 5 To prepare pure crystals of benzoic acid from a given impure sample Viva Voce 3 Measurement of pH Values 1 To determine the pH value of vegetable juices fruit juices tap water and washing soda by using universal pH paper 2 To determine and compare the pH values of solutions of strong acid HCl and weak acid CH_3COOH of same concentration 3 To study the pH change in the titration of strong base Vs strong acid by using universal indicator paper 4 To study the pH change by common

ion CH_3COO^- ion in case of weak acid CH_3COOH 5 To determine the change in pH value of weak base NH_4OH in presence of a common ion NH_4^+ Viva Voce 4 Chemical Equilibrium 1 To study the shift in equilibrium between ferric ions and thiocyanate ions by changing the concentrations of either of the ions 2 To study the shift in equilibrium between Co^{2+} and Cl^- ions by changing the concentrations of either of the ions Viva Voce 5 Quantitative Analysis 1 To prepare M 10 oxalic acid solution by direct weighing method 2 To prepare M 10 solution of sodium carbonate by direct weighing method 3 To determine the strength of given solution of sodium hydroxide by titrating it against N 10 or M 20 solution of oxalic acid 4 To determine the strength of a given solution of hydrochloric acid by titrating it against a standard N 10 or M 20 sodium carbonate solution Viva Voce 6 Qualitative Analysis Analysis of Anions Analysis of Cations Viva Voce 7 Detection of Elements in Organic Compounds 1 To detect the presence of nitrogen sulphur and halogens in a given organic compound by Lassaigne's test 2 To detect the presence of nitrogen sulphur and halogens in the given organic compound sample number by Lassaigne's test Viva Voce INVESTIGATORY PROJECTS 1 Checking of Bacterial Contamination in Water 1 To check the bacterial contamination in drinking water by testing sulphide ions Viva Voce 2 Methods of Water Purification 1 To purify water from suspended impurities by using sedimentation 2 To purify water by boiling 3 To purify water by distillation method 4 To purify water by reverse osmosis technique 5 To purify water by GAC method 6 To purify water by bleach treatment 7 To purify water by oxidising agent 8 To purify water by ozone treatment method Viva Voce 3 Water Analysis 1 To test the hardness of different water samples Viva Voce 4 Foaming Capacity of Various Soaps 1 To compare the foaming capacity of different washing soaps 2 To study the effect of addition of sodium carbonate on foaming capacity of washing soap Viva Voce 5 Tea Analysis 1 To study the acidity of different samples of tea leaves tea by using pH paper Viva Voce 6 Analysis of Fruits and Vegetable Juices 1 To analysis the fruit and vegetable juices for the constituent present in them Viva Voce 7 Rate of Evaporation 1 To study the rate of evaporation of different liquids IViva Voce 8 Effect of Acids and Bases on Tensile Strength of Fibres 1 To compare the tensile strength of natural fibres and synthetic fibres 2 To study the effect of acids and bases on tensile strength of different fibres Viva Voce

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