Ions and Electron Counts

New Regents original practice • Name: _____ Date: _____
Show your work for written answers.

In these particle models, each proton contributes +1 to charge and each electron contributes −1. Neutrons have zero charge.

1 A particle has 11 protons and 10 electrons. What is its charge?

(1) −2

(2) −1

(3) 0

(4) +1

2 A sulfur ion has 16 protons and a charge of −2. Find its number of electrons and show the charge calculation. [1]

Answer and work

_____

_____

3 What changes when a neutral calcium atom becomes Ca^{2+}?

(1) It gains two protons.

(2) It loses two protons.

(3) It gains two electrons.

(4) It loses two electrons.

4 Explain why losing an electron does not change the element or mass number of an atom. [1]

Answer and work

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Particle Detector Records

Use the information below to answer the questions.

A model detector records proton, neutron, and electron counts. Each row describes one particle.

Record	Protons	Neutrons	Electrons
P	17	18	17
Q	17	20	17
R	17	18	18
S	18	22	18

5 Which record represents an ion with a negative charge?

(1) P

(2) Q

(3) R

(4) S

6 Compare P and Q. Explain how they can be isotopes of one element even though they have different mass numbers. [1]

Answer and work

7 Which pair has equal electron counts but different proton counts?

(1) P and Q

(2) P and R

(3) Q and R

(4) R and S

8 Use the periodic table and particle counts to write the chemical symbol with charge for R and the element symbol for neutral S. [1]

Answer and work