

Geology 12 Mineralogy Review Answer Key (Pg. 51 in textbook)

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|-------|-------|-------|-------|-------|
| 1. B | 2. E | 3. C | 4. D | 5. B |
| 6. C | 7. A | 8. C | 9. B | 10. E |
| 11. A | 12. B | 13. E | 14. C | |

15. A crystalline solid is a rigid substance composed of atoms that are arranged in a regular, three-dimensional framework. In liquids and solids, atoms or molecules are not fixed into a framework, but are free to move.
16. If magnesium loses two electrons, it will gain a charge of +2.
17. Magnesium's atomic number is 12, as it has 12 protons.
18. In ionic bonding, electrons are transferred between atoms to form charged ions; the attractive force between the charged ions forms the bond. In covalent bonding, electrons are shared between adjacent atoms.
19. Compounds contain more than one element while native elements contain only one type of element.
20. In some minerals, atoms of similar size and charge can replace each other in the crystal structure (i.e., iron and magnesium)
21. Minerals are composed of very small, identical building blocks and the regular arrangement of those blocks controls the shape of the crystal and angle between crystal faces.
22. Silicate minerals are minerals that contain the silicate tetrahedron (SiO_4^{4-}) as building blocks. Ferromagnesian silicates contain iron or magnesium, and are generally dark coloured and dense (i.e., pyroxene, amphibole, biotite). Nonferromagnesian silicates do not contain iron or magnesium, and are generally light-coloured and less dense (i.e., quartz, feldspars, muscovite).
23. Positive ions are located between the negatively-charged silicate sheets of micas, balancing out the charges.
24. All carbonate minerals contain the carbonate ion (CO_3^{2-}) and usually react with acid to form bubbles of carbon dioxide gas.
25. Cleavage is the tendency of a mineral to break or split along a smooth plane. This is due to planes of weakness determined by the strength of bonds within the mineral crystal.
26. Rock-forming minerals are the most common varieties of minerals in the earth's crust. Accessory minerals make up a much smaller proportion of rocks and can be disregarded when identifying and classifying rocks.