

## EXERCISE 8

### A STUDY OF SEDIMENTARY ROCKS

Purpose: To become acquainted with the principal types of sedimentary rocks.

background: There are three main classes of sedimentary rocks. Clastic rocks are composed of fragments (pebbles, sands, clays), which are derived from the weathering of older rocks that have been deposited as sediments in the water (as a rule), and then cemented together. Rocks of organic origin are composed of the accumulated remains of shell-forming organisms or coal-forming plants. Rocks of chemical origin are composed of minerals that have been deposited from water by evaporation or chemical action. The natural cements which bind the particles of sedimentary rocks are chiefly lime, or iron minerals. The first two are white, the iron cement usually yellow-brown or reddish.

Materials: 1) Specimens of conglomerate, sandstone, shale, shell limestone, coquina, peat, compact limestone, rock salt (halite) 2) dilute hydrochloric acid 3) glass rod or medicine dropper 4) water 5) hand lenses.

Problem I: What Are the Outstanding Characteristics of the Principal Clastic Sediments? ,

a) Conglomerate is your first elastic rock. Examine it. What kinds of rock fragments does it seem to consist of? ---  
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What mineral do the large fragments seem to be? \_\_\_\_\_

From which igneous rock might this mineral have been weathered? \_\_\_\_\_

Why do you think so? \_\_\_\_\_  
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What minerals are included in the finer fragments? \_\_\_\_\_  
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How could they have been formed by weathering of igneous rocks? \_\_\_\_\_  
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b) Sandstone is another elastic rock. Describe its texture and "feel." \_\_\_\_\_  
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What kind of fragments is it made of? \_\_\_\_\_  
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What mineral or minerals does your specimen seem to include? - --- -----  
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From which igneous rock might it (or they) originate? ----- How? -----  
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c) Shale is a elastic rock. Describe its texture and "feel." -----  
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What fragments is it made of? - -----  
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From which minerals in igneous rocks are these fragments formed by weathering? --- -----  
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Moisten the shale and describe its odor. -----  
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How do you explain this odor? -----  
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See whether the shale shows thin layers (bedding planes). How do you explain them?\_ -----  
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d) Using the medicine dropper, squeeze a few drops of water onto the conglomerate, sandstone, and shale. Compare their porosity, or ability to absorb water. - --- -----  
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e) Examine each specimen-conglomerate, sandstone, and shale-to determine, if possible, which natural cement binds the fragments of each. List them, and explain how you know.

(See "Background.") - -----  
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(If you suspect a lime cement, how can you test it?) -----  
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Problem 2: How Can Organic Sediments Be Recognized?

a) Coquina is a rock formed of cemented modern shells on the beaches of Florida and elsewhere. Describe its appearance and name the types of shells you recognize. ---

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Try the acid test on coquina. What does it tell you? -----

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b) Shell limestone is composed of highly compressed and cemented shells of ancient marine organisms. Describe its appearance, and name the types of shells you recognize. -----

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Try the acid test. What does it tell you about the mineral in this rock? -----

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c) Peat is a sediment which represents an early stage in coal formation. Describe its appearance, and include the names of any plants you recognize. -----

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Problem 3: How Can Typical Chemical Sediments Be Described?

a) Compact limestone is a variety of limestone which may have been precipitated from water by chemical action. Contrast the appearance, and feel of compact limestone with that of coquina or shell limestone. -----

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Try the acid test. What does it tell you? -----

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b) Rock salt was formed by evaporation of sea water. Describe its appearance, feel, and taste.

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How can you prove it is not limestone? - - -

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