

Mars for Earthlings

LESSON 6: Igneous Rocks & Volcanics**Homework 2**

Igneous Rocks & Volcanics_MFE

Basalt & JMARS

Discussion/Questions

1. The following are common igneous/mafic rock forming minerals. For each mineral, list its chemical formula:
 - a. Olivine
 - b. Pyroxene
 - c. Amphibole
 - d. Biotite
 - e. Plagioclase (anorthite)
2. Compare the chemical formulas and their elements to the element abundance list for Mars below. Which minerals do you think will be more common on Mars? Please explain your choices below next to the list.
 1. oxygen
 2. silicon
 3. iron
 4. magnesium
 5. calcium
 6. aluminium
 7. sodium
 8. potassium
 9. chloride
3. Open JMARS. Using the *Nomenclature* layer, zoom to Valles Marineris to gain your geographical bearing. Add and compare the following layers (Add New Layer → Maps by Instrument → TES Mineral Maps): Basalt Abundance, Plagioclase Abundance (Bandfield, 2002), any olivine abundance map, and Carbonate Abundance. Warmer colors denote greater abundance.
 - a. Which map has the most coverage? Why might this be? What complications might arise from collecting this type of data? Could anything distort the data?



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- b. Where does the abundance of Plagioclase generally increase on the surface of Mars? Use geographical points of references or lat/long to explain.

- c. Compare the following animation for plagioclase abundance on Mars to the JMARS mineral map. Which perspective do you prefer?
<http://www.youtube.com/watch?v=FRU0cHb31JM>

- d. Are you surprised about the abundance of plagioclase on Mars in comparison to other minerals? Why or why not?

