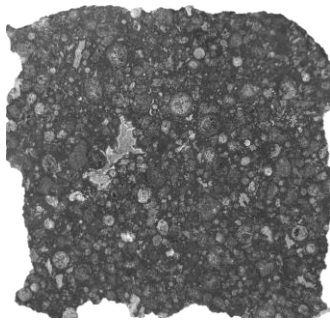


Due in section the week of March 14th

Problems are based off lecture and readings - Show all work - Don't forget units - 10pts total

1) Meteorite Classification

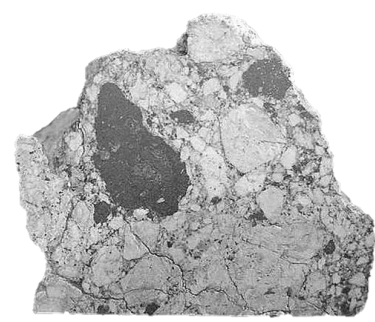
a) Given below are three examples of different meteorites. Based on their appearance and notable chemical composition determine what type of meteorite they are, rank them in order of age (1 being oldest, 3 being youngest), and briefly explain how they formed (if they form in a distinct environment or area, i.e. in an atmosphere, a planetary core, in the nebula, close or far from the sun, etc. make note of that in your answer). (3 pts)

**A**

Rich in Carbon, Calcium, and Aluminum.

**B**

Mostly Iron and Nickel

**C**

Largely Magnesium, Silicon, and Oxygen.

b) While analyzing the chemical composition of the oldest of your meteorites you notice that ratio of Magnesium to Silicon (Mg/Si) in the rock is two times higher the ratio of Mg/Si in the solar photosphere. Give a possible explanation to for origin or evolution of this meteorite. (1 pts)

2) Faults, Plates, and Mountains

a) In 2005 the Chinese Academy of Sciences announced the most accurate measurement of Mt. Everest to date at 8,844.43 m. In 1856 however, the Great Trigonometric Survey announced that Peak XV (later renamed to Mt. Everest) was the highest peak in the world at 8,839.8 m. Let's assume that these measurements are both accurate. If we assume, that as the Indian Plate crashes into the Asian Plate, half of the Indian Plate's mass goes into the Earth to be recycled, and the rest goes into building the Himalayas, how fast is the Indian plate moving? Express your answer in mm/year. (2 pts)

b) Before Pangea began to break up, the peninsula of India would have been connected to modern day Mozambique, which today are approximately 5000km apart. Using your answer from part a) calculate how long ago Pangea began to break up. Show your work. (1 pts)

c) Today we know that Pangea actually began to break up ~175 million years ago. Does your answer agree with part b)? If no, give a possible explanation as to why not and describe any assumption you may have made in part b). (1 pts)

3) Protoplanetary Disks

The year is 2020, and the James Webb Space Telescope has been returning beautiful images of disks of gas and dust around a stars. So enraptured by these images, you decide to go to Fuertes and take an image of one of these disk's blackbody, as well as the blackbody of nearby star with no disk for comparison. Below, make a sketch of the observed blackbody for: 1) the star with no disk, 2) the star with a disk. Label your graphs so it's clear where the stars are, and where the disk is. (2 pts)