

HW 3 Key

A.

a) According to (Allaby and Allaby, 2003) and (Hancock, 2000);

Erosion is a process that moves weathering products.

Weathering is a physical or chemical process that breaks down bedrock. Physical weathering results from mechanical action of the environment on bedrock such as wind, moving water, freezing, and expansion of roots, and fire. Chemical weathering is the chemical breakdown of bedrock minerals by water. Typical Chemical and mechanical weathering occur in concert.

Mass wasting is a general term for the transfer of material down slopes. It includes four main categories: flow, slide, fall, and creep.

b)

1. Weathering of the moon's surface by solar wind and erosion by impacts creates the lunar regolith.

2. The stepped sides of complex craters are an example of mass wasting.

3. Rocks broken by thermal cycles have been weathered.

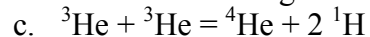
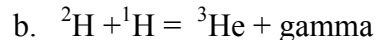
c) The air and water on the earth make terrestrial erosion much more significant.

B. According to the web pages suggested in the assignment;

1. Interest in the moon is focused on mining, in particular ^3He .

2. Solar fusion proceeds (essentially)

<http://hyperphysics.phy-astr.gsu.edu/hbase/astro/procyc.html>



Some of the ^3He escapes as solar wind before it is converted to ^4He and becomes trapped in the lunar regolith. The solar wind is a plasma, or charged, so the earth's magnetic field deflects the solar wind and ^3He . The moon has no magnetic field.

3. Fusion has the potential to provide an essentially limitless source of energy. The easiest reaction to create on earth is $D+T = He + n$, however even this reaction is so difficult to start that it is not yet practical. Furthermore the neutron produced creates radioactive waste and that is one of the many problems with fission energy. Using a reaction based on ${}^3\text{He} + {}^3\text{He}$ or ${}^3\text{He} + {}^2\text{H}$ will not produce neutrons and hence induce radioactivity. However these reactions are even more difficult than DT reactions and in real life unintended reactions will induce some radioactivity. [\${}^3\text{He} + {}^3\text{He}\$](#)
4. No one owns the moon.
5. Apollo 17 was the last “moon walk” on DEC 7-19, 1972
6. The launch vehicle is called “Aires”, the crew vehicle is “Orion” and the overall project is called “Constellation”.

Bibliography

Allaby, A., and Allaby, M., 2003, Dictionary of Earth Sciences, Oxford.
Hancock, P., 2000, The Oxford Companion to The Earth, Oxford.