Submit via e-mail (gelderman@wku.edu), due 12:40 on Monday, 15 February 2010

Chapter 1: Studying the Origins of Life --

1) A biomarker is the result of an observation or measurement that indicates the presence of current or former organic processes. Provide a clear and concise description of twelve potential biomarkers considered to be important for the recognition of molecular fossils. For each biomarker, discuss whether it is equally appropriate for extraterrestrial situations.

2) Use the Internet and any other resources to create a list of all the amino acids that have been identified as naturally occurring within the interstellar medium. Clearly and concisely explain the observational techniques that allow astronomers to identify the existence of complex organic molecules in nebulosities that are many tens or even thousands of light years from Earth.

3) Starting with the most favored current model for the formation of our Solar System, clearly and concisely discuss how the evolutionary processes in the young Solar System would or would not lead to the observed distribution of atomic and molecular complexity within the Solar System.

4) Question 1.2, page 23, from Gilmour and Sephton.

5) Provide a clear, complete, yet concise description of the energy transfer processes and chemical transformations that govern chemosynthesis and standard photosynthesis. Be sure to explain what aspect of an actual chemosynthetic environment plays the role of the porphyrins in standard photosynthesis.