



4. (10 points) Think about the mechanism for peptide bond formation during translation. Explain how formylation of the initial met might make sense in terms of this mechanism.

5. (15 points) As you know, viruses are tiny information packets consisting of a protein coat surrounding a nucleic acid core. When a new virus is isolated, its characterization begins by finding out whether its nucleic acid is DNA or RNA.

List 3 differences between DNA & RNA:

- a)
- b)
- c)

Characterization of nucleic acid from a newly isolated virus produced the following information:

- 1) Partial determination of base composition showed that [C] = 38% and [G] = 30%.
- 2) When the nucleic acid was slowly heated from 20°C to 95°C, no change in  $A_{260\text{ nm}}$  or MW occurred.
- 3) Treatment of the viral nucleic acid with NaOH resulted in a drastic reduction in MW.

Based on these data, is the viral nucleic acid DNA or RNA? \_\_\_\_\_

Is the viral nucleic acid single- or double-stranded? \_\_\_\_\_

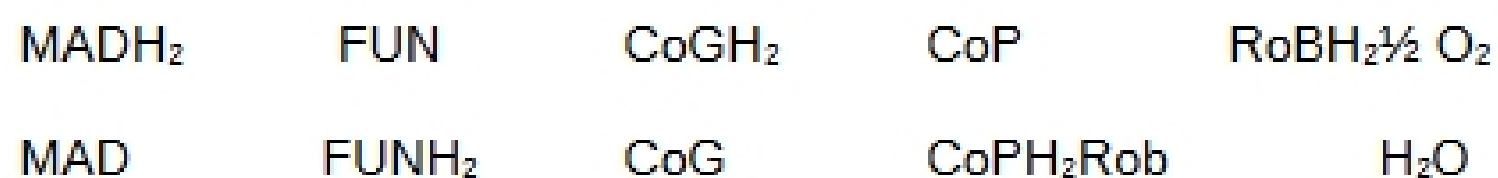
In the space below, explain how each experimental result leads to the above conclusions.

Expt. 1)

Expt. 2)

Expt. 3)

6. (10 points) Shown below is the postulated electron transport chain for *Itsa faka*, an extinct fungus. Assuming the chemiosmotic model for coupling ATP synthesis with electron transport, what is wrong with the scheme (i.e. why is this organism extinct)?



5. (10 points) An enzyme catalyzing the following reaction was isolated from a marine diatom. Analysis disclosed that the enzyme contained a tightly bound  $\text{NAD}^+$ . Suggest a reaction mechanism for the reaction. Name the enzyme.

