(1). A 1.4 g sample of a hydrocarbon (only C and H) was combusted in oxygen. 2.2 g of carbon dioxide and 0.9 g of water were obtained.
(a) What is the empirical formula?
(b) If the molecular mass is 42.0 g, what is the molecular formula?
(c) When Br₂ is added to a sample of the compound, the Br₂ is consumed (no light is required). What is a possible structure of the compound?
(d) Based on the structure in Part (c), what would be the product if we added HCl?

(2). A 0.84 g sample of a compound containing C, H, and O was combusted. 2.052 g CO₂ and 0.8395 g H₂O were obtained.
(a) What is the empirical formula of this compound?
(b) The molecular mass of this compound is 72.04 g. What is the molecular formula?
(c) A C=O was detected by infrared spectroscopy. Some KMnO₄ was added to this compound, and the product was an acid. What is a possible structure of the compound?
(d) What product would be obtained if NaBH₄ was added to the compound?