

Grade 10 of 10 points

Points

(2) 1. Give the name for the straight chain alkanes having the following molecular formulas:

0.5 pts each

(a) C_7H_{16} heptane (b) C_5H_{12} pentane

(c) C_2H_6 ethane (d) C_4H_{10} butane

(2) 2. Give the molecular formulas for the following straight chain alkanes:

0.5 pts each

(a) **butane** C_4H_{10} (b) **propane** C_3H_8

(c) **decane** $C_{10}H_{22}$ (d) **hexane** C_6H_{14}

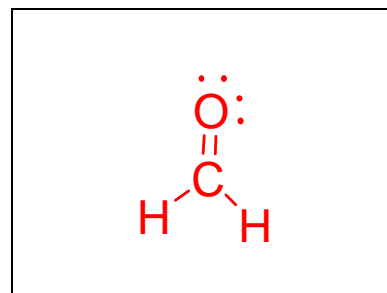
(2.5) 3. Draw the Lewis structure of formaldehyde (CH_2O) in the box at the right.

1 pt structure, 0.5 pts each blank

(a) How many total valence electrons are there? 12

(b) What is the O-C-H angle? 120°

(d) What is the hybridization about the C atom? sp^2



(2.5) 4. Following is the structure of the artificial sweetener **aspartame** (trade name “Nutrisweet”). Identify the functional groups indicated by the letters:

0.5 pts each

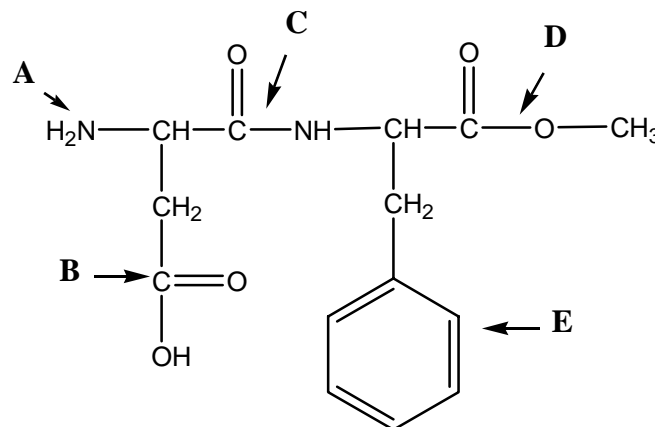
A. amine

B. carboxylic acid

C. amide

D. ester

E. aromatic



Aspartame

(1) 5. Friedrich Wohler is credited with disproving the “vital force” theory of organic compounds in 1828 when he successfully synthesized what organic compound from inorganic precursors?

urea (or NH_2CONH_2)