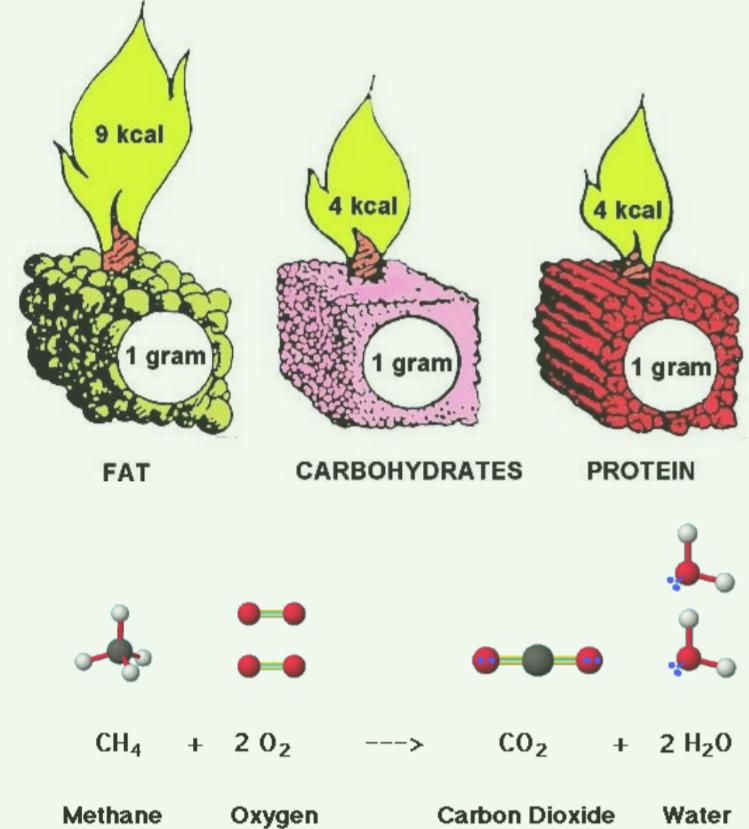
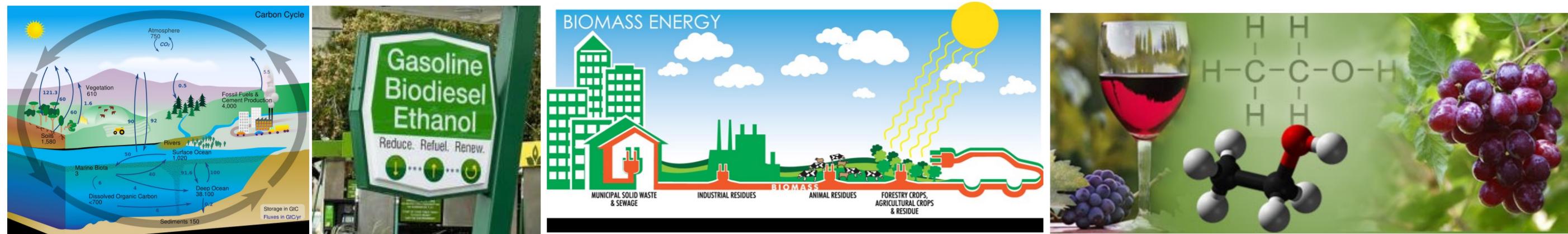
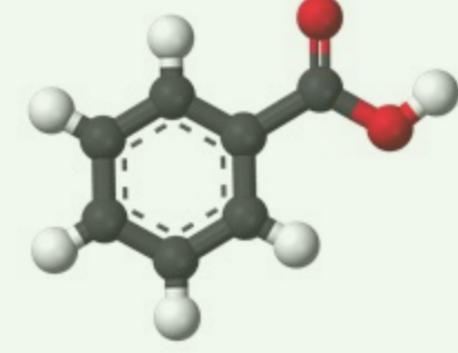


# MOLECULAR ENERGETICS

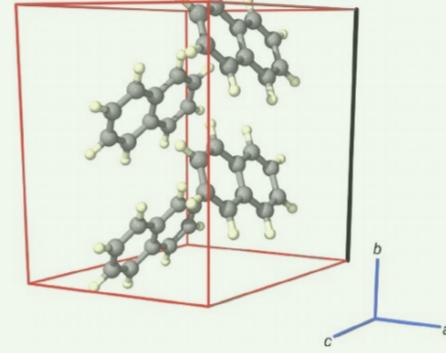
## Combustion Bomb Calorimetry



Benzoic Acid

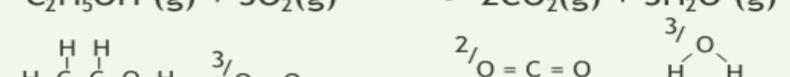


Naphthalene



$$\Delta H = \text{breaking bonds} + \text{forming bonds}$$

[this is exothermic (negative)]



$$\Delta H = [(5 \times 413) + 348 + 360 + 463 + (3 \times 498)]$$

$$+ [(4 \times -743) + (6 \times -463)]$$

$$= -1020 \text{ kJ mol}^{-1}$$

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## COMBUSTION CALORIMETRY

Measures the **HEAT** of combustion at constant volume

### CHO type compounds



### Ballistic Bomb Calorimetry

Calibration with Benzoic acid

$$\Delta U = Q = E_{\text{CAL}} \times \Delta T$$



Type K Thermocouple



→ Personal Computer  
 LABTERMO Software  $\Delta T_{\text{ad}}$

