3. (a) $m_{CH_3OH} = 200 \text{ mg} \times \dfrac{M_{CH_3OH}}{M_{\text{aspartame}}}$

$= 200 \text{ mg} \times \dfrac{32.05 \text{ g/mol}}{294.34 \text{ g/mol}}$

$m_{CH_3OH} = 21.8 \text{ mg}$

(b) $LD_{50(70\text{ kg})} = 0.07 \text{ g/kg} \times 70 \text{ kg}$

$LD_{50(70\text{ kg})} = 4.9 \text{ g}$

(c) number of cans of diet pop $= \dfrac{4.9 \text{ g}}{21.8 \text{ mg/can}}$

$= 220 \text{ cans}$

Explore an Issue: Take a Stand: Will That Be "Regular" or "Diet"?

(Page 121)

(a) Aspartame:
Reasons for its use: reducing caloric intake, to counter obesity; for sugar-reduced or sugar-free diets, e.g., for diabetic patients; reduce incidence of tooth decay.
Reasons against its use: may have undesirable side effects such as headaches; no nutritive value, may contribute to lower than required intake of minerals and vitamins.

(b) Factors to consider: experimental design, e.g., use of controlled variables; type of system tested, e.g., test done on mice, information transferred to human applications; size of population tested; number of independent research groups reporting findings; funding of the research group, e.g., funded by the manufacturer of the product.

(c) (Sample answer) Risks are still uncertain and debatable; in some cases, benefits outweigh the risks, e.g., sugar-free diets prescribed by doctor; in other cases, should reduce possible risk by keeping daily use of aspartame to a minimum.

Try This Activity: Identifying Fibres by Odour

(Page 123)

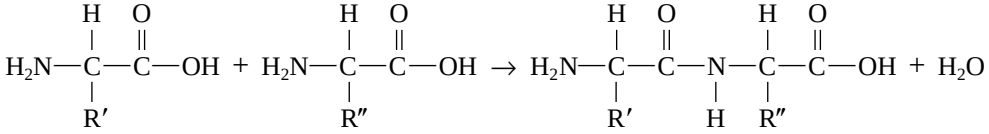
(a) Silk and wool fabrics are protein; cotton, linen, and hemp are cellulose; polyester, lycra, and nylon are synthetic.

(b) Matches contain sulfur, which, when burned, confuses the odour of the fabric burning.

PRACTICE

(Page 124)

Understanding Concepts

4. Proteins are condensation polymers: The carboxyl group of one amino acid reacts with the amino group of another amino acid, forming a peptide bond and eliminating a water molecule.
5. They are mirror images of each other and are not superimposable on each other.
6. 
7. Primary structure: the sequence of the amino acids in a polypeptide chain. Secondary structure: the three-dimensional organization of segments of a polypeptide chain; alpha helix or pleated sheet. Tertiary structure: the three-dimensional folding of the alpha-helices and pleated-sheet structures of polypeptide chains. Quaternary structure: several protein subunits may join together. See page 122 in this section for diagrams.
8. Fibrous protein: collagen, function: for structure and strength; structure: long helical chains packed closely together and form crosslinkages. Globular protein: enzymes; function: for mobility throughout the organism; structure: sections of helices and pleated sheets within the same protein attract each other and form a globular shape.