Solutions Manual for

The Elements of Polymer Science and Engineering

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Chapter 1

(e) +
$$CH_2 - \frac{H}{C} + \frac{1}{4}$$

1-2. (a)
$$+ c + cH_2 + c - H_1 + CH_2 + H_2 + H_3 + H_4$$

(b)
$$+0-CH_2-CH_2-CH_2-CH_2-0-C$$

$$(d) + ch_2 - \frac{h}{c} - ch_2 - \frac{h}{c} + \frac{h}{n}$$

$$(e) + 0 - CH_2 - CH_2 - CH_2 - CH_2 - 0 - C - 0 - C + 0 - C$$

1-3. (a)
$$\frac{100,000}{113}$$
 = 885

(b)
$$\frac{100,000}{192} = 521$$

(c)
$$\frac{100,000}{97} = 1031$$

(d)
$$\frac{100,000}{162} = 617$$

(b) same as in (a)

1-5. (a)
$$+ cH_2 - c - cH_2 - c + c + c - cH_3$$
 $c = 0$
 $c = 0$
 $c = 0$

$$(d) + cH_2 - O + \frac{1}{2}$$

- 1-6. (a) polyisobutene (polyisobutylene)
 - (b) poly(vinyl chloride) (PVC)
 - (c) poly(tetramethylene terephthalate)(poly(butylene terephthalate))
 - (d) poly(ethyl methacrylate)
 - (e) poly(vinyl acetate)
 - (f) poly(methyl acrylate)
 - (g) polycaprolactam (nylon 6)
 - (h) poly(phenylene oxide)
 - (i) poly(para-bromostyrene)
 - (j) poly(ethylene-2,5-toluene-urethane)
 poly(ethylene-2,5-tolyl-urethane)
- 1-7. (a) is too weak mechanically;
 - (c) is too difficult to shape into pipe form. The correct answer is (b).
- 1-8. The functionality of glycerol is 3 in every case listed.
- 1-9. (a) React 1 mole of HOCH₂CH₂OH with 2 moles

 O

 NCO

 reaction (1-12). Then react the product of this reaction with

 H(OCH₂CH₂CH₂CH₂-O)—H as in reaction (1-13).