

Homework #2

1. A

Tris

$$\frac{0.9 \cancel{\text{ moles}}}{\cancel{\text{ L}}} \text{ of Tris} \times \frac{121.4 \text{ g}}{\cancel{\text{ mole}}} \times 1.0 \cancel{\text{ L}} = 109.3 \text{ g of Tris}$$

Boric Acid

$$\frac{0.9 \cancel{\text{ moles}}}{\text{ L}} \text{ of Boric Acid} \times \frac{61.84 \text{ g}}{\cancel{\text{ mole}}} \times 1.0 \text{ L} = 55.6 \text{ g of Boric Acid}$$

EDTA

$$\frac{20 \cancel{\text{ mmoles}}}{\text{ L}} \text{ of EDTA} \times \frac{292.2 \text{ g}}{\cancel{\text{ mole}}} \times 1.0 \text{ L} \times \frac{1 \cancel{\text{ mole}}}{1000 \cancel{\text{ mmoles}}} = 5.84 \text{ g of EDTA}$$

Dissolve 109.3 g of Tris, 55.6 g of Boric Acid and 5.84 g of EDTA in about 0.5 L of H₂O. Once dissolved, dilute the stock solution to 1.0 L with H₂O in a graduated cylinder to form 10x TBE.

B

Tris

$$\frac{2 \cancel{\text{ moles}}}{\text{ L}} \text{ of Tris} \times \frac{121.4 \text{ g}}{\cancel{\text{ mole}}} \times 1.0 \text{ L} = 242.8 \text{ g of Tris}$$

EDTA

$$\frac{0.5 \cancel{\text{ moles}}}{\text{ L}} \text{ of EDTA} \times \frac{292.2 \text{ g}}{\cancel{\text{ mole}}} \times 1.0 \text{ L} = 146.1 \text{ g of EDTA}$$

Acetic Acid 17.4M to 2M $C_1V_1 = C_2V_2$

$$17.4 \text{ M} \times V_1 = 2 \text{ M} \times 1.0 \text{ L}$$

$$V_1 = \frac{2 \cancel{\text{ M}} \times 1.0 \text{ L}}{17.4 \cancel{\text{ M}}}$$

$$= 0.115 \text{ L or } 115 \text{ ml of } 17.4 \text{ M Acetic Acid}$$

Dissolve 242.8 g of Tris, 146.1 g of EDTA and also dilute 115 ml of concentrated acetic acid in about 0.5 L of H₂O. Once the solids are dissolved, dilute the stock solution to 1.0 L with H₂O in a graduated cylinder to make 50x TAE.

2. TBE-dilute 10x to 0.5x $C_1V_1 = C_2V_2$

$$(10x) \times V_1 = (0.5x) \times 1.0 \text{ L}$$

$$V_1 = \frac{(0.5x) \times 1.0 \text{ L}}{(10x)}$$

$$= 0.05 \text{ L or } 50 \text{ ml of } 10x \text{ TBE}$$

Dilute 50 ml of 10x TBE to 1.0 L with H₂O in a graduated cylinder to make 0.5x TBE. (Also, you could say 50 ml of 10x TBE plus 950 ml of H₂O.)

3. TAE-dilute 50x to 1x $C_1V_1 = C_2V_2$

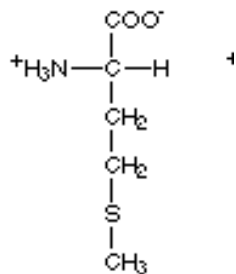
$$(50x) \times V_1 = (1x) \times 500 \text{ ml}$$

$$V_1 = \frac{(1x) \times 500 \text{ ml}}{(50x)}$$

$$= 10 \text{ ml of } 50x \text{ TAE}$$

Dilute 10 ml of 50x TAE to 500 ml with H₂O in a graduated cylinder to make 1x TAE. (Also, you could say 10 ml of 50x TAE and 490 ml of H₂O.)

4. Methionine Met M



5. Cysteine Cys C

