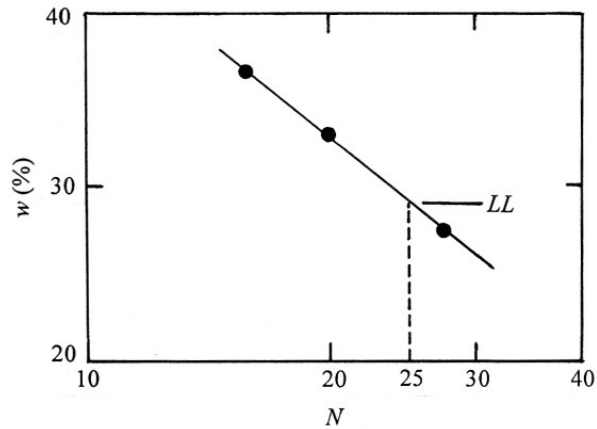


Chapter 4

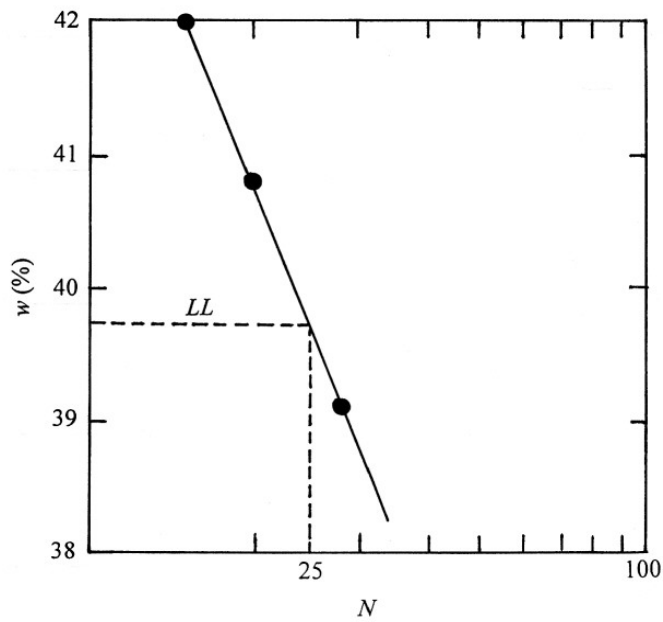
- 4.1 a. Refer to the plot of w versus N . $LL = 28.5$.



- b. $PI = LL - PL = 28.5 - 12.2 = 16.3$

4.2
$$LI = \frac{w - PL}{LL - PL} = \frac{31 - 12.2}{16.3} = 1.15$$

- 4.3 a. From the plot, $LL = 39.7$.



$$\text{b. } PI = LL - PL = 39.7 - 18.7 = \mathbf{21}$$

$$4.4 \quad LI = \frac{w - PL}{LL - PL} = \frac{26 - 18.7}{39.7 - 18.7} = \mathbf{0.384}$$

$$4.5 \quad SL = \left(\frac{M_1 - M_2}{M_2} \right) (100) - \left(\frac{V_i - V_f}{M_2} \right) (\rho_w) (100)$$

$$= \left(\frac{36 - 25}{25} \right) (100) - \left(\frac{19.65 - 13.5}{25} \right) (1) (100) = \mathbf{19.4\%}$$

$$SR = \frac{M_2}{V_f \rho_w} = \frac{25}{(13.5)(1)} = \mathbf{1.85}$$

$$4.6 \quad SL = \left(\frac{M_1 - M_2}{M_2} \right) (100) - \left(\frac{V_i - V_f}{M_2} \right) (\rho_w) (100)$$

$$= \left(\frac{44 - 30.1}{30.1} \right) (100) - \left(\frac{24.6 - 15.9}{30.1} \right) (1) (100)$$

$$= 46.18 - 28.9 = \mathbf{17.28\%}$$

$$SR = \frac{M_2}{V_f \rho_w} = \frac{30.1}{(15.9)(1)} = \mathbf{1.89}$$