

Biodegradation rate calculations

$$\begin{aligned} \text{ThOD of (PASP)} &= (44.99/ M_r) (C + 0.25 H + 0.33N - 0.5 O) \\ &= (44.99/13200)(4 + 0.25 * 5 + 0.33 * 2 - 0.5 * 3) = \mathbf{0.015} \text{ g O}_2/\text{g polymer} = \mathbf{945} \text{ mg O}_2 \end{aligned}$$

$$\begin{aligned} \text{ThOD (PASP-SEA)} &= (76.99/ M_r) (C + 0.25 H + 0.33N + 0.5 S - 0.5 O) \\ &= (76.99/18480) (10 + 0.25 * 13 + 0.33 * 3 + 0.5 * 1 - 0.5 * 8) = \mathbf{0.045} \text{ O}_2/\text{g polymer} = \mathbf{2835} \text{ mg} \\ &\text{O}_2 \end{aligned}$$

$$\text{Biodegradability \%} = \frac{BOD(sample) - BOD(blank)}{ThOD} * 100$$

For PASP, the Biodegradability % = $920 - 0.5 / 945 = \mathbf{97 \%}$

For PASP-SEA, the Biodegradability % = $2784 - 1 / 2835 = \mathbf{98\%}$