

Lockdown Carbon Iodine Absorption Test

Test methods based upon the ASTM Standard Test Method for Determination of Iodine Number of Activated Carbon (Designation: D 4607 – 94 (Reapproved 2006)).

Test 1

HCl (10 cm³, 5 wt %) was added to each carbon sample (2 g) and left for 24 hrs. Iodine solution (50 cm³, 0.05 M) was added to each sample individually and stirred for 30s, before being filtered. Filtrate (10 cm³) was titrated with sodium thiosulphate (0.1 M), using starch indicator¹ near to the end point.

Table 1 Results of the titrations performed in Test 1

Carbon Sample	Volume sodium thiosulphate required / cm ³	Moles sodium thiosulphate required / $\times 10^5$ mol	Moles iodine in filtrate / $\times 10^5$ mol	Moles iodine absorbed per gram / 10^5 mol g ⁻¹
AC	0.33	3.3	1.6	24.2
Bio	5.30	53.0	26.5	11.8
Apple	2.88	28.8	14.4	17.8
Oak	1.75	17.5	8.8	20.6
Pine	1.58	15.8	7.9	21.1

Test 2

HCl (5 cm³, 5 wt %) was added to each carbon sample (1 g) and left for 1 hr. Iodine solution (25 cm³, 0.05 M) was added to each sample individually and left for 48 hrs, with frequent stirring. Samples were filtered and filtrate (10 cm³) was titrated with sodium thiosulphate (0.1 M), using starch indicator¹ near to the end point.

Table 2 Results of the titrations performed in Test 2

Carbon Sample	Volume sodium thiosulphate required / cm ³	Moles sodium thiosulphate required / $\times 10^5$ mol	Moles iodine in filtrate / $\times 10^5$ mol	Moles iodine absorbed per gram / 10^5 mol g ⁻¹
AC	0.05	0.50	0.25	24.9
Bio	0.45	4.50	2.25	23.9
Apple	0.15	1.50	0.75	24.6
Oak	0.10	1.00	0.50	24.8
Pine	0.18	1.75	0.88	24.6

¹ Starch indicator was made by stirring corn starch (1 g) in distilled water (10 cm³), then adding it to boiling distilled water (100 cm³) and boiling for 1 minute before allowing to cool.

Results

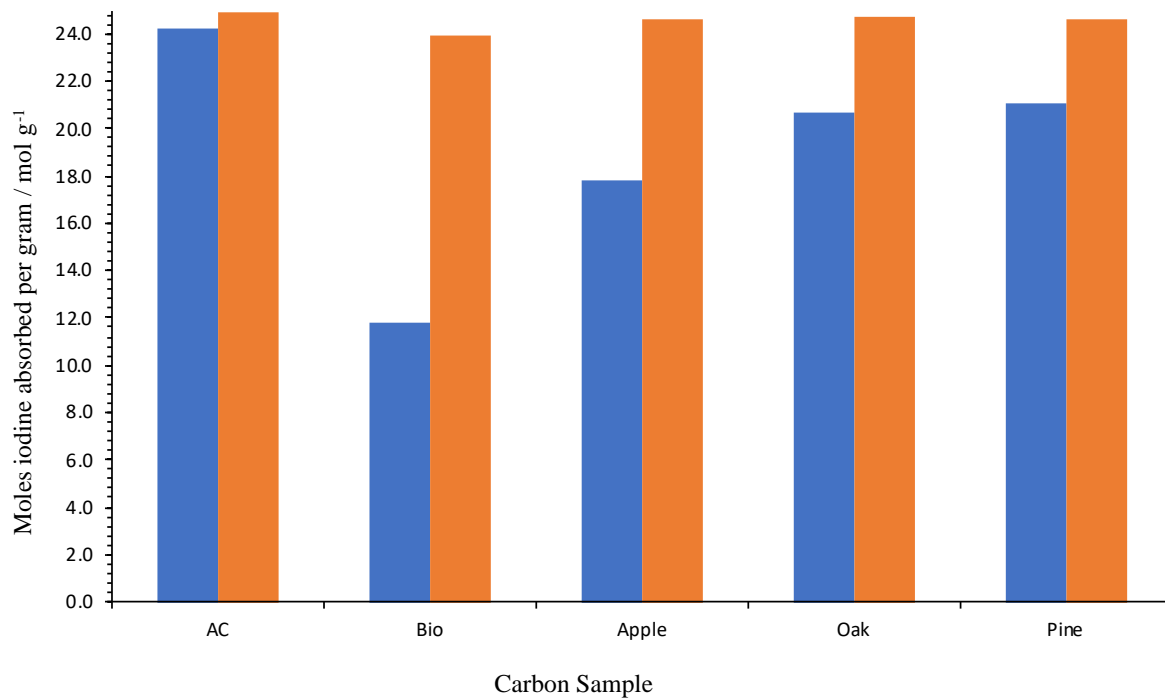


Figure 1 Graph showing the difference in the iodine absorption of the samples from Test 1 (blue) and Test 2 (orange)