THE IODINE ABSORPTIONS, COMBINING WEIGHTS, AND MELTING-POINTS OF CERTAIN FATTY ACIDS.

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THE iodine absorptions of a large number of oils and fats may be found in "Allen's Commercial Organic Analysis" (Second Edition, Vol. ii., page 50), but, so far as I know, the percentages of iodine absorbed by the fatty acids themselves have never yet been published.

This is a matter of considerable importance, as it is often necessary to examine very minutely the nature of the fatty acids separated during the analysis of soap. The melting-point and combining weight of the fatty acids are usually relied upon to give the required information, and in many cases the data thus obtained are sufficient for the purpose. If, however, any doubt exists, the determination of the iodine absorption of the fatty acids often proves of great value.

I have recently been working very extensively upon the fatty acids from tallow and lard, and from cotton-seed, olive, linseed, rape, castor, cocoa-nut, palm, and sperm oils. Several samples of each kind of oil or fat were examined, and the averages of all the results obtained are recorded in the annexed table. For the sake of comparison I also give the melting-points and combining weights of some of the fatty acids, which appear in "Allen's Organic Analysis" (Second Edition, Vol. ii., pages 213 and 215), most of which agree fairly well with my own results.

Name of Oil or Fat.	Iodine Absorption.	Combining Weight.		Melting Point.	
		R. W.	Other observers.	R. W.	Other observers.
Tallow	41·3 per cent.	276	270 to 285	119° F.	—
Lard	64·2 „	296	270 to 285	100° F.	111° F.
Cotton-Seed Oil....	115·7 „	289	275 to 337	96° F.	95° F.
Olive Oil	90·2 „	286	270 to 285	81° F.	79° F.
Linseed Oil	178·5 „	283	307	75° F.	75° F.
Rape Oil	105·6 „	307	321	71° F.	67° F.
Castor Oil	93·9 „	292	290 to 306	—	—
Cocoanut Oil.....	9·3 „	201	196 to 204	75° F.	75° F.
Palm Oil	53·4 „	263	269 to 273	114° F.	122° F.
Sperm Oil	88·1 „	305	289	56° F.	—

The combining weights are the figures obtained by dividing the number of milligrammes of fatty acids taken for the titration by the number of c.c.'s of normal alkali required.

The melting-points were determined by the ordinary capillary tube method.

An examination of the above figures will show that my combining weights agree very closely on the whole with the results of other chemists. My melting-points also correspond very well with those of other observers, the only important discrepancies being in the case of palm oil and lard.

The low melting-point obtained by me in the case of lard may possibly be due to some of the samples which I examined having been made from the fat of the entire animal, while the sample of which Mr. Allen gives the melting-point, was most probably prepared solely from the omentum. As might naturally be expected, all the iodine absorptions are somewhat higher than those of the oils and fats from which the fatty acids were derived.

These results will, I hope, prove of some benefit to those engaged in the analysis of soaps, and in other cases in which an examination of fatty acids is necessary.

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