DETERMINING THE VALUE OF VEGETABLE AND ANIMAL OILS.*

Nowhere in the domain of chemistry do we find such a large and important series of compounds, so similar in chemical and physical properties, and so difficult of separation when mixed, as the fatty oils. Watts enumerates forty-nine vegetable oils, eleven fish oils, and five animal oils, making a total of sixty-five oils, and yet his list is defective. Although possessing such a general family resemblance, they differ enough among themselves to cause a considerable difference in price, and hence cheaper oils are used to adulterate the more valuable. To recognize any of these oils when unmixed is not particularly difficult, but to detect the presence of a few per cent. of one oil in a large quantity of some other oil is more difficult, and to determine the kind and quantity of the adulterating oil is almost an impossibility. Because of the commercial value of an accurate and reliable method of detecting adulteration in oils, much attention has been paid to this subject, but long and patient researches have, as yet, been only partially rewarded. In a communication to the Chemical Section of the Philosophical Society of Glasgow, Mr. J. J. Coleman, F.C.S., gives a detailed account of the principal methods now in use for detecting adulterations in oils, a few of which we give below.

The late Prof. Calvert constructed a table showing the result obtained by treating oils with acids and alkalies of various strengths. Twelve reagents were employed and one hundred and eighty reactions and colors produced are given, which he had observed in experimenting on fifteen different oils. Cotton-seed oil and olein from tallow are omitted, as well as fifty others of minor importance.

Heidenrich, Penot and Marchand have also proposed colour tests from the reaction of pure sulphuric acid on oils, but, like those of Calvert, they are open to doubt and uncertainty, the coloration often depending on the accidental impurities of the oil.

There is a great difference in the amount of heat produced on mixing one part of sulphuric acid with three parts of oil; the gain in temperature is 100° where rape-seed oil is used, as compared with 68°, when olive oil is experimented upon. A method based on this principle was suggested by Marmene and elaborated by Fehling; it is easy of execution and interesting in results.

The relative viscosities of the fatty oils is determined by the time required for a given quantity of each oil to flow from a pipette which is heated to 120° F. by being surrounded by a glass tube into which steam is passed. In an experiment made by Mr. Coleman, German refined rape required 8½ minutes; olive, 8¼ minutes; tallow, 7½ minutes; lard oil, 7 minutes; cotton seed, 7 minutes; sperm, 5 minutes.

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