XI. On the purification of rapeseed oil

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To cite this article: C. Thenard (1801) XI. On the purification of rapeseed oil , Philosophical Magazine Series 1, 10:37, 68-69, DOI: [10.1080/14786440108675891](https://doi.org/10.1080/14786440108675891)

To link to this article: <http://dx.doi.org/10.1080/14786440108675891>

Published online: 18 May 2009.

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XI. *On the Purification of Rapefeed Oil.* By C. THENARD*.

TO purify oil of rapefeed, mix 100 parts of the oil with from $1\frac{1}{2}$ to 2 parts of sulphuric acid, and stir the mixture. The oil will immediately change its colour; it will become turbid and assume a blackish-green tint, and at the end of three quarters of an hour it will be full of flakes. You must then give over stirring it, and add gradually double its weight of water to remove the sulphuric acid, which, if allowed to remain too long with the oil, would not fail to exercise too strong an action on it, and to char it. The mixture must then be beat for at least half an hour, to bring the molecule of the oil, the acid, and water, into contact with each other; after which it is to be left at rest.

When it has rested about eight days, the oil will float on the surface of the water, and the latter will itself float on a black matter, precipitated from the oil by the sulphuric acid: it is this matter which colours the oil, and prevents it from burning with facility. Three very distinct strata, then, are established, as is here seen: the upper one is oil; the second is aqueous, and contains a little sulphuric acid; and the third is carbonaceous. The oil which forms the upper stratum, after these eight days of rest, is far from being limpid: twenty days, in my opinion, would be necessary for it to purify itself merely by repose; but by filtration it may be immediately obtained perfectly clear and transparent. For this purpose, pounded charcoal, and a piece of linen or cotton cloth, may be employed: the two last substances are preferable to any other. The same cloth will serve several times, only it must be carefully cleaned.

By following this process with attention, you may obtain oil which has much less colour, odour, and taste, than that commonly used; which will burn with the greatest facility, and without any residuum; and which is equal to the purest oil sold in the shops, &c. The loss is very inconsiderable.

If you are desirous of obtaining it still purer, it may be exposed again to the same treatment; but, in that case, for 100 parts of oil, one hundredth part of concentrated sulphuric acid will be sufficient. The sulphuric acid will not form in oil which has been once purified a blackish precipitate; on the contrary, it produces a very scanty precipitate, of a grayish-white colour. This precipitate is more difficult to be separated than the former.

* From *Journal de Physique*, Floreal, an. 9.

When the oil has been treated with two hundredth parts of sulphuric acid, if it be suffered to digest for twenty-four hours with the fourth of its weight of chalk or carbonate of lime, or of argil, you will obtain it almost as clear as water. Lime, however, cannot be employed with advantage, as it would occasion too much waste; but, in my opinion, argil would give very advantageous results: it retains, indeed, a pretty large quantity of oil, but, by means of a press, the last portions of the oil may be extracted from the argil almost entirely.

XII. *Researches respecting the Laws of Affinity.* By C. BERTHOLLET, Member of the French National Institute.

[Continued from Vol. IX. p. 351.]

XII. *Of Complex Affinities.*

1st, UNDER the more general name of *complex affinity* I shall examine that which has been considered as arising from the concurrence of four affinities, and which is generally distinguished by the name of *double affinity*.

To give an idea of the action of four affinities, Bergman examines what takes place when a solution of sulphate of potash and muriate of lime are mixed together. This, says he, is as if one should put into the quantity of water employed the proportions of sulphuric acid, muriatic acid, lime, and potash, which enter into the composition of these salts: the two bases act by their affinities on these two acids; but though the affinity of the potash for the sulphuric acid be stronger than that which it has for the muriatic acid, the affinity of the muriatic acid for the potash, however, added to the affinity of the sulphuric acid for the lime, gives a sum of forces greater than the affinity of the sulphuric acid for the potash, and that of the muriatic acid for the lime, which determines an exchange of bases; so that, instead of sulphate of potash and muriate of lime, there are produced sulphate of lime and muriate of potash. This explanation is always founded on the supposition, that the affinities are constant forces independently of the quantities and the state of saturation.

2^d, When the two bases act conjointly on one acid, the latter divides itself, or rather divides its action, in the ratio of their masses. Instead of one acid there are here two; and if no separation is effected, either by precipitation or crystallisation, the acids