LIV.—*Note on a Compound from Benzoïn and Acetone.*

By Francis R. Japp, F.R.S., and Julius Raschen, Ph.D.

In a note in the Proceedings for May 20th, 1886, p. 203, "On Compounds from Benzil and Benzoïn with Alcohols," we described a compound melting at 249—250°, to which we assigned the formula $C_{46}H_{40}O_4$, believing it to be formed by the condensation of benzoïn with ethyl alcohol under the influence of caustic potash.

In the paper in the Transactions, in which an account of this result ought to have appeared, we mentioned (Trans., 1886, 833) that in the meantime we had found that this compound was not formed when pure alcohol was employed, and that its formation was due to some impurity contained in the methylated spirit which we had used instead of duty-paid alcohol. We reserved an account of the compound until we had ascertained the conditions of its formation.

We soon found that the impurity in question was acetone, and that the compound is apparently formed according to the equation

$$2C_{14}H_{12}O_2 + 2C_3H_6O + O = C_{34}H_{28}O_3 + 4H_2O.$$

The occurrence of an oxidation is assumed, partly because we found that a much better yield was obtained when air had access during the reaction, and partly because the formula $C_{34}H_{28}O_3$ agrees somewhat better with the results of analysis than the formula $C_{34}H_{30}O_3$, which would be that of a compound formed merely with elimination of water.

In order to prepare the compound, 10 grams of caustic potash were dissolved in a litre of alcohol; 40 grams of finely powdered benzoïn and 20 grams of acetone were added, and the whole was allowed to stand at ordinary temperatures in an open flask for several days, at first shaking the mixture from time to time, until the benzoïn had dissolved. The new compound gradually separated in very slender, silky needles. A quantity of potassium benzilate, formed by the joint action of air and caustic potash, could be readily removed by washing the product with water. The new compound was purified by recrystallisation from hot benzene, in which it is sparingly soluble, separating in slender needles on cooling. It was also recrystallised from boiling alcohol. It melted, as already stated, at 249—250°. The analyses agreed with the formula $C_{34}H_{28}O_3$.

	Substance.	CO_2.	H_2O.
I.	0·1327	0·4098	0·0731
II.	0·1399	0·4321	0·0784
III.	0·1409	0·4345	0·0780

	Calculated for $C_{34}H_{28}O_3$.		Found.		
			I.	II.	III.
C_{34}.....	408	84·30	84·22	84·23	84·12
H_{28}	28	5·78	6·13	6·22	6·16
O_3	48	9·92	—	—	—
	484	100·00			

Analyses I and II were made with substance recrystallised from benzene; in III, the same specimen further recrystallised from alcohol was employed.

The formula $C_{34}H_{30}O_3$, on the other hand, would require C 83·95 and H 6·17 per cent.

The foregoing work was done in 1886, and its publication has been deferred, in the hope (hitherto unfulfilled) that an opportunity might be found of further investigating this compound. An attempt to prepare corresponding compounds from homologues of acetone gave no result under conditions similar to the foregoing.

In a paper in the July number of the Transactions (p. 644), Dr. A. Smith states that he has obtained from benzoïn and acetone by the action of potassium cyanide a compound, to which he assigns the formula $C_{24}H_{20}O_2$, deriving it from benzaldehyde and acetone, according to the equation—

$$3C_6H_5{\cdot}CHO + CH_3{\cdot}CO{\cdot}CH_3 = C_{24}H_{20}O_2 + 2H_2O.$$

No further details are given, so we are unable to say whether this compound is identical with that obtained by us. The formula $C_{24}H_{20}O_2$ requires C 84·71 and H 5·88, with which our analyses would also agree, although not so well as with the formula calculated by us.

Dr. Smith's promised investigation will doubtless decide as to the identity or non-identity of these compounds.

Normal School of Science,
South Kensington.