

Short Communication

A New Reaction Product from Acetylacetone and *p*-Benzoquinone

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In 1927 Ionescu¹ described a reaction between acetylacetone and *p*-benzoquinone leading to a dihydroxydiacetylindacene. The reaction obviously being base-catalysed, took place in pyridine solution to which the reactants were added in the correct molar ratio.

It has now been found that if *p*-benzoquinone is dissolved in about ten times its own weight of very pure acetylacetone to which 3–4 per cent of pyridine has been added, the reaction takes a different course. In poor yield (5–8 per cent of theory) an intensely red-coloured substance separates as fine needles. The substance (M. p. 212–213° dec.) has the empirical formula $C_{16}H_{16}O_6$.

Calc.	C	63.16	H	5.29
Found	»	63.15	»	5.30

(Actually no molecular weight determinations could be carried out due to the slight solubility of this compound and its derivatives. Classifying it as a C_{16} -compound, however, is in agreement with the number of C-atoms in the starting materials, assuming that no rupture of C–C bonds has occurred during the reaction).

$C_{16}H_{16}O_6$ gives a positive iodoform reaction, is soluble to some extent in water and dissolves readily in aqueous alkali, the solution being dark violet. On addition of mineral acid the original substance

separates again. Prolonged action of alkali brings about far-reaching decomposition of the substance.

On catalytic hydrogenation it takes up one mole of hydrogen. The colourless, hydrogenated substance (M. p. ca. 205°) is rather unstable when exposed to the air, especially when in solution but also in the solid, crystalline state. With acetyl chloride it gives a stable diacetate (M. p. 220–221°) with the formula $C_{20}H_{22}O_8$.

Calc.	C	61.53	H	5.69
Found	»	61.50	»	5.92

The substance $C_{16}H_{16}O_6$ is obviously capable of undergoing a reductive acetylation, but as the product is very difficult to purify no reliable analysis of it has so far been obtained.

The red substance is further subject to some interesting transformations when treated with hydrogen chloride in various organic solvents. With methanolic hydrogen chloride it gives a colourless and chlorine-free product $C_{17}H_{18}O_6$ (M. p. 149–150°) containing one methoxyl group.

Calc.	C	64.15	H	5.69	OCH ₃	9.74
Found	»	63.93	»	5.62	»	9.71

Most of the above-mentioned facts seem to have a bearing upon the substance $C_{16}H_{16}O_6$ being a quinone. The author, however, will not suggest any structural formula yet, but has nevertheless found it appropriate to publish his results at this stage. The investigation will be continued.

1. Ionescu, M. V. *Bull. Soc. Chim.* [4] 41 (1927) 1096.

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