LI.—*The System, Picric Acid–5-Phenylacridine.*

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In preparation for some work which was contemplated, it became necessary to examine the fusion diagram of the system, picric acid–phenylacridine. Results worth recording have been obtained. The substances used were purified by crystallisation, and the method employed was the usual one of determining the temperatures at which various mixtures of known composition began to solidify. The mixture was melted in a tube immersed in a bath of paraffin wax. The tube was fitted with a cork with two holes, through which passed a glass stirrer and a thermometer with its bulb completely immersed in the molten liquid.

The bath was allowed to cool so that the temperature of the mixture fell about 1° per minute, the mixture being stirred gently and its temperature read every half-minute until it was just below

the freezing point as found from a first determination. The mixture was then stirred more vigorously until crystallisation began and the temperature rose to the freezing point and remained constant for one and a half to two minutes.

The freezing points of the various mixtures are shown in the table. The temperatures have been corrected for the error of the thermometer and also for the error due to the exposed part of the stem.

The known picrate of phenylacridine (one molecule of picric acid to one molecule of phenylacridine) is clearly indicated with a stable melting point, 227·7°. There is also definite indication of a second compound (two molecules of picric acid to one molecule of phenylacridine) with an unstable melting point at about 180°.

Attempts to isolate the latter compound by mixing hot or cold alcoholic or benzene solutions in correct proportion or with a slight excess of picric acid always resulted in the separation of the compound melting at 227·7°, but on mixing cold, concentrated, alcoholic solutions in the proportion of five molecules of picric acid to one molecule of phenylacridine a precipitate was obtained which, after being filtered, washed once with alcohol, and dried, softened at 178° and melted at 185—186°. This was the new compound of two molecules of picric acid with one molecule of phenylacridine. (Found: N = 13·3. $C_{31}H_{19}O_{14}N_7$ requires N = 13·74 per cent.)

In appearance the two picrates are very similar, although the compound containing two molecules of picric acid is somewhat yellower than the other.

Molecular percentages of phenyl-acridine.	Freezing point.	Molecular percentages of phenyl-acridine.	Freezing point.	Molecular percentages of phenyl-acridine.	Freezing point.
0·00	120·3°	29·25	175·6°	58·42	215·7°
1·00	119·8	30·00	176·2	65·54	201·1
1·88	119·3	30·66	178·2	76·10	175·1
3·07	118·8	31·00	180·4	76·94	172·0
4·02	122·3	31·20	181·4	78·00	169·4
7·31	132·4	35·00	195·4	79·50	169·9
12·53	145·4	43·15	217·2	82·03	170·7
20·72	161·7	48·75	226·4	87·06	172·5
24·91	168·8	50·00*	227·7	95·40	178·2
26·40	171·2	50·75	226·4	100·00	181·9
28·00	173·6	52·10	225·1		

* The same freezing point was obtained for the 50 (molecular) per cent. mixture prepared by weighing out the dry constituents as for the phenylacridine picrate previously prepared and crystallised from alcohol.

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