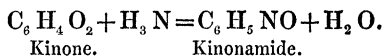
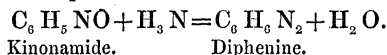


beautifully crystalline mass, *kinonamide*,  $C_6H_5NO$ , which stands midway between kinone and diphenine,



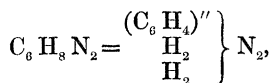
Another similar step of transformation would lead to diphenine,



The preparation of azobenzol in large quantity, its transformation into dinitrazobenzol, and, lastly, the conversion by means of sulphide of potassium of the nitro-compound into diphenine, present so little difficulty, that treatment of diphenine with nascent hydrogen affords the easiest and simplest means of procuring beta-phenylene-diamine in appreciable quantity.

VII. "Contributions towards the History of the Colouring Matters derived from Aniline." By A. W. HOFMANN, LL.D., F.R.S. Received June 2, 1863.

In a short paper recently submitted to the Royal Society, I pointed out the existence of two aromatic diamines, both represented by the formula



and closely resembling each other, but differing in some of their fundamental characters to such an extent that I did not hesitate to assert their individuality, and to distinguish them as alpha-phenylene-diamine and beta-phenylene-diamine.

The existence of two closely allied bodies among the diatomic derivatives of the phenyl-series very naturally suggested the idea of searching for two similarly related monatomic bases of the same group, and accordingly I undertook during the last week a careful comparison of specimens of aniline prepared by different processes. This comparative study is still incomplete, but I beg leave to record even now an observation which appears to merit the attention of chemists.

I have, in the first place, examined aniline obtained by distillation of isatin (indigo) with hydrate of potassium.

The base prepared in this manner boils at  $182^\circ$ , and possesses the general characters attributed to aniline. But neither by treatment

with mercuric or stannic chloride nor with arsenic acid is this substance converted into aniline-red.

Aniline derived from benzol was next submitted to examination. The benzol employed for the preparation of the base was partly obtained by the distillation of benzoic acid with lime, partly by the fractional distillation of coal-tar naphtha, and the ultimate solidification of the product, boiling between  $80^{\circ}$  and  $83^{\circ}$ .

Both varieties of benzol were treated with fuming nitric acid, and the nitro-compound thus obtained converted into aniline by means of iron and acetic acid.

The base prepared from benzoic benzol boils at  $182^{\circ}$ . Like indigo-derived aniline, it refuses to yield the red colour by treatment with the agents previously mentioned.

Aniline obtained from coal-tar benzol, as might have been expected, likewise boils at  $182^{\circ}$ , and neither mercuric nor stannic chloride nor arsenic acid converts this substance into aniline-red.

When I communicated these observations to my friend Mr. E. C. Nicholson, I found that in this case, as in so many others, practice is far in advance of theory. The facts which I have mentioned had been long known to this distinguished manufacturer, who in reply to my note transmitted to me a gallon of absolutely pure aniline boiling at  $182^{\circ}$ , prepared from coal-tar benzol, and perfectly incapable of yielding aniline-red.

During the last few months I have had occasion to examine a great variety of commercial specimens of aniline, more especially samples which had been kindly supplied to me by Messrs. Simpson, Maule, and Nicholson, of London, and by Messrs. Renard Brothers and Franc, of Lyons. All these specimens furnished, by the ordinary processes, very notable quantities of aniline-red, but they also invariably boiled at a higher temperature, exhibiting in fact boiling-points varying between  $182^{\circ}$  and  $220^{\circ}$ .

*It is thus obvious that commercial aniline contains a base different from normal aniline, the cooperation of which is indispensable for the production of aniline-red.*

Is this base an isomeric variety of aniline, an aniline holding to the normal aniline a relation somewhat similar to that which obtains between alpha- and beta-phenylene-diamine? \* It is well known

\* Phil. Mag. S. 4. vol. xiii. p. 415 (June 1857).

that Mr. Church has separated from coal-tar naphtha a hydrocarbon isomeric with benzol, *parabenzol*, which boils at  $97^{\circ}5$ . This substance is readily converted into a nitro-compound, and ultimately into the corresponding base. Is it the base thus formed which gives rise to the formation of aniline-red?

Or is it not more probable that commercial aniline contains another base analogous or homologous with aniline which is involved in the generation of the red?

These are questions equally interesting for theory and practice, and the solution of which will probably throw considerable light upon the still enigmatical genesis of rosaniline.

VIII. "Contributions towards the History of the Colouring Matters derived from Coal-tar." By A. W. HOFMANN, LL.D., F.R.S. Received June 9, 1863.

In a previous Note I have shown that the red colouring matter cannot be obtained from *normal* aniline by the action of the agents usually employed for the preparation of this colour on a large scale. This observation naturally induced me to seek for the constituent in the commercial aniline which gives rise to the formation of aniline-red.

I have already remarked that the commercial product which is best suited for the manufacture of the red colour, boils at a temperature appreciably higher than the boiling-point of normal aniline. The idea presented itself of submitting this substance to a fractional distillation, or else of effecting a methodical separation of the hydrocarbons which constitute the starting-point for the manufacture of the bases; but, as is well known, these processes are difficult and tedious, and there is little chance of success unless the operation be performed on a very large scale.

In the hope of accelerating the inquiry, I examined the action of mercuric and stannic chlorides upon the homologues of aniline, of which I fortunately possessed some pure specimens. The contiguous term *toluidine* was the first to fix my attention. The presence of this base in commercial aniline could not be doubted, since the benzol employed in the manufacture of this substance almost invariably boils at temperatures between  $80^{\circ}$  and  $100^{\circ}$ , or even higher. Indeed Mr. Nicholson having convinced himself that pure aniline is not