

On the decomposition of chloroform by alcoholic sodium hydroxide solution

Annalen der Chemie und Pharmacie, Vol 123, p121-122.

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Some time ago during a reaction in done in commercially purchased chloroform with alcoholic sodium hydroxide I observed one emit a gas with a combustibile green lined flame which could not be obtained when pure chloroform was used in the experiments. This gas is considered to be identical with the compound of Regnault, C_2H_3Cl , which arises from the 'protochloride' (German "Elaychlorür", possibly a precursor to 'dichlorocarbene') and therefrom both when closed from the lower chlorine content that chloroform to contamination by 'protochloride'. Later however, I have also observed the occurrence of the gas with the use of pure chloroform. Further experiments have shown that the same is obtained in all the more abundant quantity with ever more dilute or aqueous alcoholic sodium hydroxide solution. It burned if not passed through cold water, however was caught under the same conditions with a green flame; If it was previously blotched by water no green color was noticeable, but rather a glow. The same was repeatedly shaken with water and left to stand over a long time so it was when ignited the exact the non-luminous blue flame of carbonic oxide, and thus was identified with no doubt.

Chloroform behaves towards a water-rich or dilute alcoholic solution of potash, similar to how bromoform behaves towards potassium hydroxide which, according to Hermannforms only carbon monoxide and potassium bromide.

This formation of carbonic oxide seems to me to have little standing in accordance with the molecular concept of chloroform popular in recent times, according to which it should be the one triatomic chloride, whereas radicals should be C_2H . This being the case, implementation of the same with potash solution you should more certainly expect to see a complete transformation to formic acid, with a more dilute potash solution applied, the less the decomposition. But it is precisely under these circumstances that the formation of carbonic oxide takes place.

This decomposition appears only understandable if one gives chloroform, the formula: C_2Cl_2 , with HCl attached. It is then to differentiate the following stages: First, separating the hydrochloric acid from the chlorine carbon corresponding to the carbon monoxide, then this is decomposed and forms carbon monoxide, which finds KOH-particles in sufficient accumulation to completely form formic acid. In the case of not doing the latter it partially escapes as a gas.

