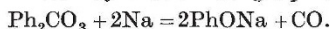


Carbon Monoxide from Carbonates

IN the course of an investigation of the stability of certain ketylic derivatives we have found that carbon monoxide is produced in quantitative yield through the interaction of metallic sodium with certain non-polar carbonates. Thus, sodium reacts readily with a warm xylene solution of diphenyl carbonate with the formation of sodium phenoxide and carbon monoxide, as indicated by the following equation:



The evolution of carbon monoxide proceeds quite smoothly and the gas is obtained in a state of high purity. In fact, the reaction is well adapted for the laboratory preparation of pure carbon monoxide. It is also interesting to note that the gas as thus prepared is so dry that it does not explode on 'sparking' with dried oxygen.

The above reaction also occurs with alkyl carbonates, such as ethyl carbonate.

We have obtained evidence to show that the reaction occurs through the intermediate formation of ketylic derivatives. The dimeric forms of these derivatives, containing the phenoxy group, are unstable and suffer rapid decomposition with the elimination of sodium phenoxide. On these premises, it is interesting to note that the immediate precursor of carbon monoxide is the unknown oxide, C_2O_3 .

Work along these lines is in progress in this laboratory, and further details will be published elsewhere.

S. T. BOWDEN.

T. JOHN.

The Tatem Laboratory,
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Electrostatic Explanation of the Phenomenon of Flotation

PROF. KAMIENSKI suggests¹ that the adsorption of certain organic substances at the surfaces of platinum, graphite, and galena is due to an electrostatic attraction between them and globules of an emulsion formed by the organic substance. It is claimed that these solid surfaces are positively charged and that the emulsion is negatively charged. He then proposes that such an action is the basis of flotation.

This explanation of the basis of flotation is unsatisfactory. Adsorption of xanthates occurs readily from true solutions of their alkali salts, and flotation is possible in the absence of any emulsification. Moreover, the author himself states that there is a decrease in the potential of the surface, even when the emulsion is so dilute that its character is lost. It is uncertain what is meant by this change, but if it means a transition to true solution, the experimental results become very interesting in another connexion. They would then hint that adsorption from solution is accompanied by a decrease in the potential of the surface, from which it might be argued that negative ions—presumably xanthate ions—are adsorbed. This conclusion has been reached on other grounds.

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Department of Chemistry,
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¹ NATURE, 129, 59, Jan. 9, 1932.

The Cry of Tin

THE experience of Dr. Chalmers¹ with regard to the 'cry' emitted by cadmium and tin during plastic deformation agrees exactly with that of Mathewson and Phillips² obtained in coarsely crystalline zinc. In 1927 they recognised and discussed a silent process of simple slip which was unproductive of twins, and,

furthermore, a type of deformation which caused both a 'crackle' and multiple twinning.

In his letter, Dr. Chalmers states that he has "... not been able to produce a cry with any metal crystallising in a cubic system, for which twinning does not take place". Lest there be any ambiguity, it may be said that cubic metals sometimes show mechanical twinning, the Neumann bands of α -iron being a case in point. During experiments involving the cold-rolling of crystals of iron containing 1.8 per cent of silicon, I distinctly heard a crackling sound from the metal, and subsequent examination showed the presence of twins.³ That this is no unique observation is evident from the work of Mathewson and Edmunds⁴ on silicon-bearing iron, but they take the matter somewhat further. In their 1928 paper we read: "Single crystal strips with cubic planes nearly parallel to the surface, crackled noticeably when pinched between rolls but produced only a few bands. When rolled on dodecahedral planes, virtually all the deformation occurred by a quiet slipping process." It may be pointed out here that compression or rolling of iron crystals on (011) faces produces much more strain-hardening than compression on cubic faces.

Dr. Chalmers observes that the 'cry' was only noticed in aggregates which exceeded a certain crystal grain size. I have observed that in α -iron the larger the grain size the greater is the ease of production of Neumann bands, and the smaller the resistance of the metal to failure by shock.⁵ Ordinary fine-grained iron only twins at room temperatures by impacting, but the addition of certain other elements both enlarges the grain size and permits of the production of twins by static deformation. The elements which behave in this way are phosphorus, tin, silicon, and aluminium, and it is perhaps not without significance that metallurgically they may roughly be described as deoxidisers.

HUGH O'NEILL.

The Victoria University of Manchester,
May 9.

¹ NATURE, 129, 650, April 30, 1932.

² Amer. Inst. Min. Met. Eng., 143; 1927.

³ Amer. Inst. Min. Met. Eng. (Iron and Steel), 229; 1928.

⁴ Amer. Inst. Min. Met. Eng. (Iron and Steel), 311; 1928.

⁵ J. Iron and Steel Inst., 1, 417; 1926.

Isotopic Constitution of Lead

As described in a previous communication,¹ we have found from the hyperfine structure of the lead spectrum that the ordinary element contains, in addition to Pb^{208} , Pb^{206} , and Pb^{207} , a fourth isotope, Pb^{204} , with an intensity of 1 per cent. Owing to the presence of mercury (particularly Hg^{204}) in the discharge, the first analysis of lead by means of the mass spectrograph could not detect this new isotope. Recently, Aston² has repeated his analysis and reported Pb^{204} , together with four other weaker isotopes (209, 203, 205, and 210).

As our communication was not mentioned by Aston, we wish to point out that his data concerning Pb^{204} are in good agreement with ours. Although, according to Aston's results, 209 is just sufficiently intense to be observable by our method, our plates show no indications of its presence. With regard to 203 and 205, which are also the mass-numbers of the thallium isotopes,³ it should be mentioned that thallium was always present in spectroscopically appreciable quantities in all our samples of ordinary ('accumulator') lead. We therefore consider that the possibility of a contamination of the sample by traces of thallium should not be overlooked before the mass numbers 203 and 205 are finally attributed to lead. This point illustrates an advantage of the spectroscopic method, as the wave-lengths of the spectral lines are determined