

## Preliminary Communication

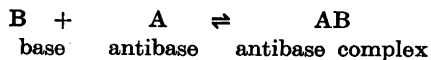
### Bases, Antibases and Antibase Complexes

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J. N. Brønsted has defined a base as a molecular species, which can combine with a proton to yield the corresponding acid:  $B + H^+ \rightleftharpoons BH^+$ . The present author agrees, that it hereby has been unequivocally established what should be understood by an acid and a base. However, as pointed out by G. N. Lewis and others, numerous other reactions in chemistry show similarities with acid-base equilibria, and bases may well react according to the above equation with many other agents than the proton: so *e. g.* with acid anhydrides, free unsolvated metal ions or unsaturated coordination compounds of any kind.

The author proposes to denote such agents in general as *antibases* and the combination products of base and antibase as *antibase complexes*. We are then immediately led to the fundamental equation:



Depending upon the character of the antibase the AB-complexes are either

acids = proton complexes, acid anhydride complexes *e. g.*  $CO_3^{2-} = CO_2 + O^{2-}$ , or coordination complexes as  $HgCl_2$ ,  $Ag(NH_3)^+$ ,  $Ag(NH_3)_2^+$ ,  $BF_4^-$  etc.

G. N. Lewis has developed an electronic theory of acids and bases in which he employs the name base in much the same sense as it is used by Brønsted, and the name acid in a sense close to the here introduced term antibase. But this appears to be an unfortunate choice and not logically correct, for if an extension of the term acid is desired, the antibases *eo ipso* can never be acids, and it is only the reaction products of base and antibase, which show analogy to the ordinary acids.

Just as the proton many other antibases cannot exist in solution without being bound to the solvent, and consequently it is then not possible to measure the absolute stability of the AB-complex, but only the stability relative to the solvated antibase. However, other antibases, *e. g.*  $CO_2$  and  $BF_3$ , can exist in a free state in solution or in the vapour phase, and the antibase-base equilibrium constant:

$$k_{A,B} = \frac{a_{AB}}{a_A \cdot a_B}$$

therefore in many cases gives an absolute measure of the stability of the antibase complex. A more detailed analysis of the terms introduced here will follow.

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