THE IONOSPHERIC CONDITIONS *

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Abstract: A general analysis of ionospheric conditions has been made in the light of possible ionic reactions occuring in the upper atmosphere. Data obtained on various parameters, such as ionic production and recombination, show that precise knowledge of the spectral distribution of solar radiation is needed and that other experimental determinations on the dissociative recombinations are required.

The ionic complexity of the ionosphere is underlined by describing how the atomic ions O^+ and N^+ react with N_2, O_2 and NO molecules. The behavior of the molecular ions N_2^+, O_2^+ and NO^+ depends on a group of simultaneous processes involving charge transfers and ion-atom interchanges which are more important than dissociative recombinations. The altitude distribution of ions is exemplified by discussing the relative importance of various loss coefficients in the D, E and F regions. It is seen that molecular nitrogen ions are subject to important charge transfer processes, that nitric oxide ions are always final products destroyed only by dissociative recombination. Additionally, the entire production of atomic oxygen ions is related to the photoionization of molecular nitrogen. Some information is also given on possible anomalies in the ratio of O_2^+ and NO^+ densities in the lower ionosphere. The lack of sufficient experimental information on ionic processes shows that a precise analysis of the ionospheric behavior remains highly speculative.

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no Russian translation has been received

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