# THE ENHANCED FORMATION OF N-NITROSOAMINES IN FULVIC ACID MEDIATED ENVIRONMENT

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This paper reports observed evidence for the role of fulvic acids in mediating the formation of N-nitrosamines from nitrite and secondary amine precursors. The N-nitrosamines are of particular environmental and health importance, because as a class these compounds have the potency for mutagenic, teratogenic and carcinogenic activity. The formation of nitrosamine depends generally on the direct nitrosation of secondary amines. However primary and tertiary amines are also potent precursors since they may be converted to secondary amines. Direct nitrosation occurs optimally at pH 3.40, the $pK_a$ of $HNO_2$, but another reaction pathway catalyzed by certain carbonyl compounds (for example HCHO and $Cl_3CHO$) can produce nitrosamines under neutral or even basic conditions. Results of the present study have indicated the catalytic effect of fulvic acids in the nitrosation process. We have found that significant quantities of NDBA (N-nitrosadibutylamine) are formed even at pH 5.50, in the presence of fulvic acids. However the exact mechanism of fulvic acid mediated nitrosation is inherently so complex, that it is a subject which requires a comprehensive investigation.