
SHC 18. ENVIRONMENTAL TOXICOLOGY OF EXPLOSIVES

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Explosives are used on a large scale by both the military and by various civilian industries (e.g. mining, high-energy metalwork, and civil engineering). Explosives utilization contributes to the high environmental contamination. TNT (2,4,6-trinitrotoluene), RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine), HMX (octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine) are found mainly in soils and surface waters; there have also been cases of groundwater contamination. Most explosives are stable due to their chemical structure and potential for binding to the organic matter, thus making soil remediation difficult. Additional limitation is the high toxicity of explosives. The release of explosives into the environment can occur during several stages of munitions production, storage, transport, and usage, including manufacturing, handling, loading, and final dispersal or disposal. Most explosives are considered to be a major hazard to biological systems due to their toxic and mutagenic effects. Manufacturing inputs can also be organic compounds or hazardous materials that require special handling due to risks (such as carcinogens). The decomposition products, residual solids or gases of some explosives can be toxic. There is still a lack of studies about the toxicity of explosives. Moreover, most of the studies conducted thus far have been based on determining toxic effects of individual substances. Explosives usually appear as mixture in the environment. This can cause difficulty in assessing their individual effects.

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