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# Micro/nanoplastics in drugs that are stored in synthetic polymer bottles; an unseen danger to humans

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## Abstract

Most of the life-saving drugs are stored in synthetic polymer bottles. Our group has found out leaching of micro and nanoparticles into the drugs. What is the risk? The leaching of micro and nanoplastics and additives into the pharmaceutical formulation and its toxicological perspective on the human system is not yet studied in detail.

Recently, our group has isolated micro and nanoplastics from pharmaceuticals especially by using an in-house developed extraction procedure. The isolated particles were irregular in shape with less than 50  $\mu\text{m}$  in diameter. Most of the particles were transparent in nature and a few were colored particles. The Raman spectral analysis showed characteristic peaks at 638  $\text{cm}^{-1}$ , 852  $\text{cm}^{-1}$ , 1010  $\text{cm}^{-1}$ , 1121  $\text{cm}^{-1}$ , 1234  $\text{cm}^{-1}$ , 1348  $\text{cm}^{-1}$ , 1459  $\text{cm}^{-1}$ , 1608  $\text{cm}^{-1}$ , 2917  $\text{cm}^{-1}$ , 2943  $\text{cm}^{-1}$ , and 2969  $\text{cm}^{-1}$  corresponding to the polyethylene terephthalate polymers. We suspect that these polymers could be leached from the storage containers made up of polyethylene terephthalate polymers. Leaching could have occurred through mechanical damage or chemical reaction with the pharmaceutical formulation. As medical plastics especially, single-use plastics are becoming a normalized requirement in the healthcare sector, their usage has been constantly increasing (especially due to the COVID pandemic). At present, the complete prohibition of plastic usage in healthcare settings is certainly a challenging process. More studies are required to study its characterization and how it interacts with the drug generic compound ?

**Keywords:** Micronanoplastics, Pharmaceuticals PET bottles, Generic compound, Excipients

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