Mod Chem Appl 2019, Volume 07
DOI: 10.4172/2329-6798-C1-015



# Low cost bio-sorbents for simultaneous removal of various contaminants from wastewaters produced during energy generation processes

**Irum Zahara**
University of Alberta, Canada

Water and energy infrastructures are interdependent, as energy is required for water extraction, desalination, treatment and transportation. The energy industry also required water such as water is needed for resource exploitation (fossil fuels), energy conversion processes (refining), power production and transportation. Today, washing and cooling has now become the dominant processes for many of the substantial industries. These industries have in-return affected the quality of water and the aquatic ecosystems that depend on clean water. With continuously growing population and increasing demand for energy consumption is leading to water contamination and its proper treatment has now become a global issue of concern. The water used for energy production becomes contaminated through a variety of ways and carries wide range of contaminants such as inorganics (heavy metals), organics and other water soluble/miscible by-and co-products. Cost effective, sustainable and scalable treatment methods with high removal efficiency for the removal of multiple contaminants are highly desirable. Recently we have developed a sorption technology which uses modified/engineered keratin biopolymers from poultry feathers to remove heavy metals. Besides many other natural materials, keratins proteins provide an excellent role to be used as bio-sorbents or filtration systems to remove toxic contaminants because of their functional groups and side chains as backbone structures. The developed sorbents were tested at lab scale for the removal of nine trace metals. The results are highly promising with very high sorption affinity ≤80% removal of metals. We are currently testing to expand applicability of these bio-sorbents for a wide range of contaminants. The overall aim is to develop an alternative, low cost and environment friendly sorption technology that is both effective as well as economically viable for industrial scale wastewater treatment to simultaneously remove multiple contaminants produced by energy generation processes.