

# Airborne asbestos fibers in an urban ambient air of Urmia City (after drying Lake Urmia), West Azerbaijan, Iran and health risk evaluation

V. Golestanishishevan<sup>(1)</sup>, M.H. Abbaspour<sup>(2)</sup>

<sup>(1)</sup> Faculty of Geology, IAU University-Khoy Branch, Iran.  
+989126712427, golestani.vahid@iaukhoy.ac.ir

<sup>(2)</sup> Faculty of Basic Sciences, IAU University-Khoy Branch, Iran.  
+989144419642, m.abbaspour@iaukhoy.ac.ir

**1. Introduction** – Asbestos has harmful effects on the health of human being and animals. Today, the relationship between presence of asbestos fibers in the air breathed by humans and developing serious diseases such as lung cancer (asbestosis) and mesothelioma has been proven. This study was designed and conducted after drying Lake Urmia within the time period of April 2016 and September 2018 to determine the concentration of asbestos fiber in the ambient air of Urmia City and to evaluate their health effects for the general population of the city. For this purpose, samples were taken from six points, and overall 46 air samples were taken along the years. The samples were then analyzed by the phase contrast microscopy (PCM) method. Also, to investigate the type of asbestos and for more accurate counting of fibers, SEM analysis and EPMA were utilized. Finally, based on the EPA IRIS method, the health effects resulting from asbestos risks were also evaluated.

**2. Results and Discussion** – The results of this study indicated that the mean annual concentration of asbestos fiber in the ambient air of Urmia City was obtained as 0.0018 f/ml PCM and 0.0074 f/ml SEM. Furthermore, the most polluted point was S5 point (0.0117-0.0028f/ml, PCM), while the lowest concentration was related to S2 point (0.001 f/ml PCM-0.0023 f/ml SEM). The mean annual risk resulting from airborne asbestos fiber in the ambient air of Urmia City for all samples was obtained as  $1.78 \times 10^{-6}$  to  $2.3 \times 10^{-4}$ , which was higher than the recommended risk range in some points.

**3. Conclusions** – The results of this study showed that Urmia City is very polluted in terms of asbestos fiber concentration, i.e., the concentrations are higher than the values recommended for exposure throughout the lifetime. The findings also suggested that high asbestos concentration levels in the ambient air of this city are mostly due to the drying of Lake Urmia, industrial activities, traffic, exploration mines and extraction of sand and gravel, meteorological conditions, and geographical location.

## 4. References

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