Measurement of Radon Emanation and Its Correlation with Indoor Radon Levels in Some Areas of Mallow

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Radon222 is a chemically inert gas with an atomic number of 86. It forms from the natural decay of Uranium238. It is the second leading cause of lung cancer in Ireland. This is due to the emission of alpha-particles when it decays into the radioactive elements of Polonium, Lead and Bismuth. The alpha-particles can penetrate cells, delivering enough energy to either kill the cell or transform it by damaging its DNA. Radon levels have been reported to be very high in Mallow, Co. Cork. Studies in 2007/2009 show high Radon levels in our school, Based on this, it was decided to carry out surveys in the Mallow area including our school. The main aim was to determine the number of residential units that exceeded the reference level of 200 Bq/m3. The results were used to construct a Radon “hotspot” grid for Mallow. It was important to determine if there was a correlation between soil Radon levels and indoor Radon levels. It was also imperative to investigate the transfer of soil Radon levels to plants and to determine if there was a correlation between these. Radon levels in construction materials and water from various sources were also measured. A variety of methods were used for measuring Radon levels. These included long-term passive Radon detectors, home made short-term passive Radon detectors and digital Radon monitors. As most Radon detectors are very expensive, home made detectors were constructed 62.5% of houses exceeded the reference level. A positive correlation was found between indoor Radon levels and soil Radon levels and also between soil Radon levels and plant Radon levels. High Radon levels were also found in ground water and some construction materials. A positive correlation was found between air temperature and indoor Radon levels.

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