RADON HAZARDS

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Contents

Summary

Many recent scientific studies have indicated that high concentrations of indoor radon can pose a major health hazard for residents. Radon is present in trace amounts in the air everywhere, but tends to accumulate at high levels indoors and in areas of particular geological conditions. The present article reviews various aspects of the radon problem that may pertain to the public interest, including the nature of radon, its progeny, associated health risks, and measurement and mitigation methods.

1. Introduction

In recent decades, radon gas has emerged as one of the leading issues in the study of indoor air quality. Radon is present in trace amounts in the air everywhere, but tends to accumulate at high levels indoors or at locations with restricted ventilation. Many scientists have indicated that, arguably, radon is the second leading cause of lung cancer in the world. A comprehensive report on the potential health hazard of radon is given by BIER IV (1988). We should admit that even at present, the overall effects of radon on human health are still subject to debate (e.g. BEIR VI, 1994). However, such a debate should not undermine the possibility of the gas as a public health concern. The present article is intended to be a non-technical overview of those aspects of the radon problem that may pertain to the interest of the common citizen; it is not meant to be a thorough discussion of the state-of-the-art study of the subject. Detailed reviews of the scientific

aspects of the radon problem have been presented, among others, by Nazaroff and Nero (1988), Nazaroff (1992), Nero et al. (1990), Lao (1990), Nagda (1994), and Edelstein and Makofske (1998).

2. What is Radon?

Radon is a natural radioactive gas formed by the decay of uranium and thorium in the earth's crust. It is an invisible, odorless, and tasteless gas at room temperature. With an atomic number of 86, the nucleus of the radon consists of 86 positively charged protons. On the periodic table, radon belongs to the group of noble elements, which include the inert gases such as neon (Ne) and xenon (Xe). In addition to the most common radon-222, there are other isotopes of radon, such as thoron (Rn-220) and actinon (Rn-219). The three isotopes differ in the number of neutrons carried within the nucleus. Radon is chemically quite inactive and does not combine with other elements. Its radioactive nature, however, poses a possible health hazard, which comes primarily from its decay products, or progeny.

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Biographical Sketch

Lung Sang Chan is currently Associate Professor in the Department of Earth Sciences at the University of Hong Kong and Chair of Geological Society of Hong Kong. He received his doctorate degree at the University of California in 1984 and taught geology and geophysics at the University of Wisconsin in 1984-1994. His current research in on urban geophysics, in particular application of geophysical methods to engineering and environmental studies, and the geology of Hong Kong and South China.