



## RESEARCH ARTICLE

### INDOOR RADON MEASUREMENT IN SOME APARTMENTS

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Environmental monitoring and indoor radon measurement are important for health life to give advises to the people in order to reduce the cancer risk of respiratory system. In the present research, radon concentration in the air has been measured at indoor of 40 apartments in Mashhad city with PRASSI system. Most of people close the doors and windows during the cold days in winter and use natural gas as fuel and other household usage. So, the radon concentration level increases as we expect. The result demonstrates about 35% of apartments have radon level low than the normal level (48 Bq/m<sup>3</sup>) and more than 65% have high radon concentration. We suggest reducing radon level at homes by suitable simple ventilation systems.

**Key Words:** Sorghum, Batter, Physical parameters, Idli, Organoleptic evaluation

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## INTRODUCTION

Radon (220Rn) and Thoron (222Rn) in indoor space, such as houses and apartments, originate and emanate from the wall, floor and ceilings which are constructed of building material, rock or soil. Also, it release from materials brought into the room, such as radon-rich water or natural gas fuel, and by radon or thoron in inlet air, which may in turn have a normal concentration of the gases or an increased concentration derived from sources outside the room (UNSCEAR (1982). Radon is one of the most dangerous radioactive elements in the environment. The greatest fraction of natural radiation exposure in humans results from inhalation indoor and in work places of the decay products of radon which are short lived daughters such as 218Po and 214Po (Mansour *et al.*, 2005; Panatto *et al.*, 2006). The radon progenies are solid isotopes that found in aerosol and when inhaled, they constitute the major source of health risk. In fact, they adhere to the internal wall of the respiratory tract, and can induce lung cancer (Marley *et al.*, 1998). It has been estimated that radon and its short-lived decay progenies contribute with three quarters of the annual effective dose received by man from natural terrestrial sources and is responsible for about half of the dose from total sources (UNSCEAR, 1982; Mansour *et al.*, 2005).

In the last few years national authorities and the public in general have shown a renewed interest in natural radiation in the environment, particularly the concentration of radon gas in homes. During the cold days most of people close the doors and windows; so, air ventilation is minimized and the radon concentration level increases in indoor spaces. In the present research, radon concentration in the air has been measured at indoor some apartments in Mashhad-the second city after Tehran, located in north-east of Iran- with PRASSI system.

## MEASUREMENT

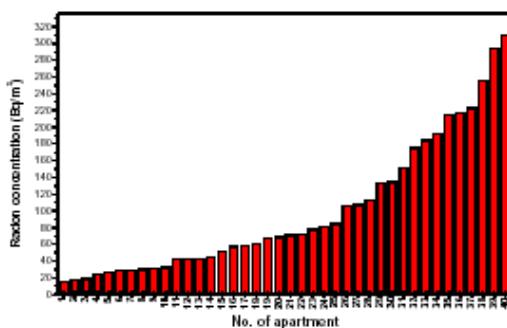
The PRASSI (Portable Radon Gas Surveyor SILENA) Model 5S has been used for indoor radon concentration measurement. This system is particularly well suited for this type of measurement. PRASSI pumping operates with constant fallow rate at 3 liters per minute and its detector is a scintillation cell coated with ZnS(Ag) 1830 cm<sup>3</sup> volume.

## RESULTS AND DISCUSSION

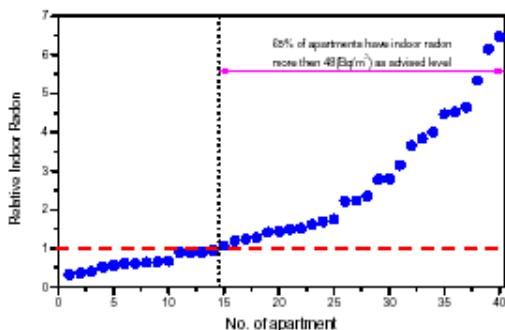
In this work, radon concentration in the air of some apartments in Mashhad city has been measured with

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PRASSI system. Most of people close the doors and windows during the cold days; so, the radon concentration level increases as we expect. Fig. 1 shows the histogram of radon concentration at 40 apartments. The result demonstrate about 35% of apartments have radon level low than the normal level (48 Bq/m<sup>3</sup>), as shown in Fig. 2. Some of the apartments have radon level exceed the normal level up to 5-6 times! We must mention the mean outdoor radon was 15.2 Bq/m<sup>3</sup> in that time.



**Fig. 1. The histogram of radon concentration in the air of 40 apartments**



**Fig. 2 Relative radon concentration of the 40 apartments (The measured data are normalized to 48 Bq/m<sup>3</sup> as normal indoor radon level).**

## CONCLUSIONS

Nearly 50% of annually radiation dose absorption of human is due to radon which is one of the main cancers cause at respiratory and digestion systems. The result demonstrates about 35% of apartments have radon level low than the normal level (48 Bq/m<sup>3</sup>) and more than 65% have high radon concentration! To improve the social health, it is necessary to training public people how they can reduce the indoor radon level by simply way such as using fans or air circulate systems.

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