RADIATION MONITORING DEVICES/TECHNOLOGY

RADIATION RELATED PRODUCTS: JP Labs has developed a series of products to monitor radiation. Many of these products are based on the solid-state polymerization of diacetylenes. Dr. Patel, President of JP Labs, is the pioneer of monitoring ionizing radiation based on the solid-state polymerization of diacetylenes and has been working on them since 1975. JP Labs has about fifteen issued and pending (US and abroad) patents on monitoring ionizing radiation.

FILM FOR RADIATION THERAPY AND IMAGING: JP Labs pioneered the technology of monitoring radiation therapy with process-less radiochromic films (US Pat# 5,420,000/Y1993). The radiation therapy films are commercially available. We have developed significantly superior radiation sensitive films for imaging radiation sources and for monitoring radiation therapy. Our film is not affected by ambient conditions such as light and humidity, can be stored for a few years at room temperature and is less expensive to manufacture.

BLOOD RADIATION INDICATOR: About 10% of fresh blood (~15 million units) is radiated at a dose of 25 Gy. Commercially available blood radiation indicators are difficult to make, require refrigeration, develop color prematurely and are very sensitive to UV/sunlight. Our blood radiation indicator is easy to manufacture using commercially available printing equipment. It has no effect of ambient light, negligible effect of 1 day of sunlight and can be stored at room temperature for a few years. These indicators, which barely cost a few cents to manufacture, can be sold for a dollar. The estimated global annual market for the blood radiation indicator is about $20 million.

RADTriage, AN EMERGENCY RADIATION DOSIMETER: In a radiological emergency, such as an accident at a nuclear power plant or an attack with a dirty bomb, one of the first things one needs is a dosimeter. All other radiation dosimeters are expensive, bulky, fragile and require a power source. RADTriage is the only credit card sized, instantly color developing, emergency dosimeter for monitoring a medically significant dose of ~20 mSv (diagnostic/tolerable dose) through ~10,000 mSv (fatal dose). It minimizes panic and worry, and triages radiation exposure for medical treatment in a radiological incident. It is ready 24/7 and requires no reader, batteries or maintenance. For a summary, see a video at https://youtu.be/uTaKmhyluHo. The other modifications of RADTriage are RADSticker (a post-office stamp sized RADTriage), SeeRad business card and RADTriage-TLD (a dual-sensor, high accuracy dosimeter). These are the only products JP Labs manufactures.

3D DOSIMETRY: Tumors are three dimensional (3D) and the radiation dose delivered to kill the tumor should be precisely aimed to the tumor and not to the surrounding healthy tissues. Dose delivery systems are calibrated using three dimensional phantoms and radiation detectors. We have developed a solid state 3D dosimeter for radiation therapy planning. Diacetylenes and other radiation sensitive formulations are dispersed or dissolved in an acrylic resin and used as sensor material. When radiated from different directions, it creates the shape of the tumor in the center.

DO-IT-YOURSELF DEVICE FOR MONITORING RADON: Radon is a radioactive gas which is found in the basements of houses. Radon can cause cancer. Commercially available devices are expensive and need to be returned for analysis. JP Labs has developed a do-it-yourself device for monitoring radon gas which leaves a permanent record with the user. The device has a color producing layer. It is based on the etching of tracks produced by the particles emitted by radon which are made visible to naked eye. The concentration of the radon gas is determined from the number of track spots using a calibration chart/table. The major advantages of our device over the commercially available devices include: (1) being a do-it-yourself device, the user does not need to return the device to a laboratory for analysis and interpretation of the results, (2) it leaves a permanent record of the results with users and (3) it would be less expensive than those available in the market. The estimated market is tens of millions of dollars.