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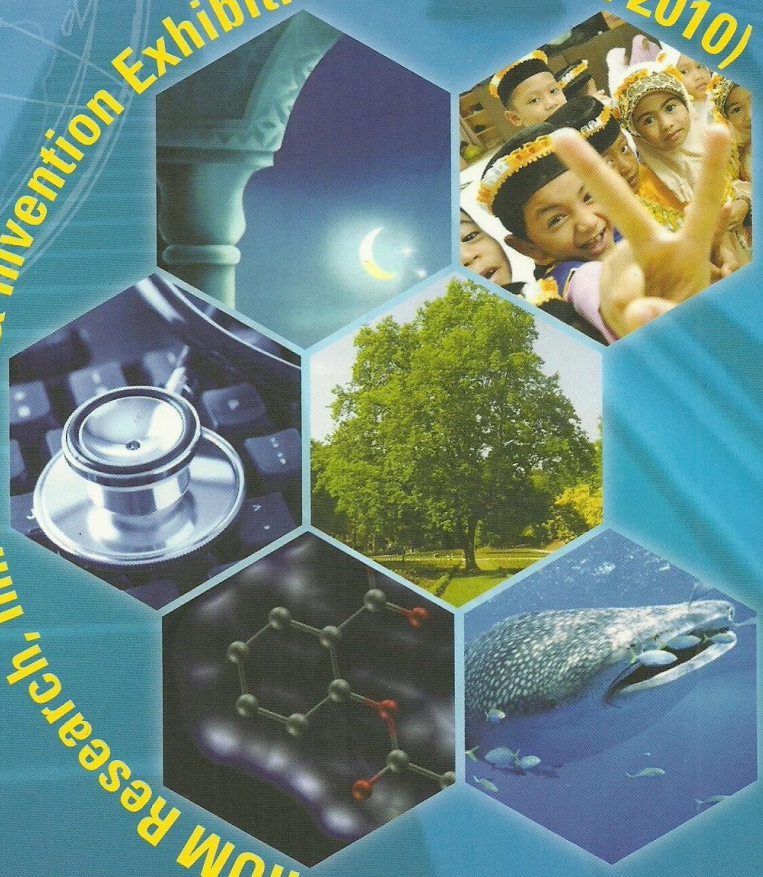

ENHANCING QUALITY RESEARCH & INNOVATION for SOCIETAL DEVELOPMENT

PP-176 Blind Encoding Into Qudits

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We consider the problem of encoding classical information into unknown qudit states belonging to any basis, of a maximal set of mutually unbiased bases, by one party and then decoding by another party who has perfect knowledge of the basis. Working with qudits of prime dimensions, we point out a no-go theorem that forbids 'shift' operations on arbitrary unknown states. We then provide the necessary conditions for reliable encoding/decoding.

PP-181 Artificial Nose for Alcohol Detection

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Our research presents the development of an artificial olfactory system as a non-destructive instrument to detect and measure concentration of alcohol. The hand-held unit will consist of an alcohol sensor, a microcontroller to calculate the concentration of alcohol and blood alcohol concentration (BAC), and an LCD display, which will display the percentage of alcohol concentration detected.

PP-184 Electron Beam Crosslinked Natural Rubber/Multiwalled Carbon Nanotube Nanocomposite

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The physical properties of the rubber blends are influenced by vulcanization and filler distribution. Normally, rubbers are vulcanized by systems based on sulfur or peroxide with the most common filler carbon black. Radiation can also produce crosslink densities like those obtained by sulphur curing, but the net effects, are similar, though not identical. The type of crosslink formed in this method (–C–C–) give rise to better mechanical properties at higher temperature. This work reports on the investigations carried out on natural rubber (SMR) filled with the multiwall carbon nanotubes (MWCNTs). This system of SMR/MWCNTs was subjected to different radiation dosages and compared with nonradiated samples in order to determine the improvement in mechanical properties of the rubber system in the presence of MWCNTs and irradiation dosages. The amount of MWCNTs in this study was varied from 1 to 7 Phr and the irradiation doses were varied from 50 to 200 KGy. Mechanical properties, especially, tensile strength (TS), elongation at break had been studied as a function of irradiation dose and degree of loading with MWCNTs. Gel fraction indicated an increase in the degree of crosslink with the increase in the MWCT and radiation dosage. XRD was carried out to check the increase in the crytallinty of the nanocomposite system. The overall results obtained indicate significant improvement in the mechanical and thermal properties by radiation crosslinking in presence of MWCNTs. These results were further supported by TEM micrograph and nanoindentation.