generated at mineral sands processing plant were characterized in this study, the aerosol samples were zircon and monazite concentrates. A cascade impactor with six stages was used to collect mineral dust particle with aerodynamic diameter (d) in the range of 0.64 to 19.4 μm. The particles impacted in each stage of the cascade impactor were analyzed by PIXE (Particle Induced X rays Emission) which permits the elemental mass air concentration and the MMAD (Mass Median Aerodynamic Diameter) of the mineral dust particles determination. The chemical compounds in the aerosol samples were identified by PDMS analysis. This study shows that using PIXE and PDMS techniques it is possible to determine the chemical compound in which the elements are associated in the aerosol particles, the elemental mass concentration and the Mass Median Aerodynamic Diameter (MMAD).

[12/05/99 - Sala N1 - 09:45]

THE PIEZOELECTRIC CHARACTERIZATION OF ANIONIC COLLAGEN FILMS

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Polymeric composite materials, both of natural and synthetic origin, constitute by far the broadest and most diverse class of biomaterials. Collagen have great potencial, in the field of bioactive biomaterials. Collagen, the most abundant protein of the animal kingdom, has a long history as biomaterial. We can find it in prostheses of heart valves, in artificial skins, in contact lenses and in injectable gels for soft tissue augmentation. In this work we did a study of the physicochemical, dielectric and piezoelectric properties of anionic collagen films, considering the development of new biomaterials which have potential applications in coating of cardiovascular prostheses, support for cellular growth and in systems for controlled drug delivery.The thermal stability of the collagen was determined by measures of its denaturation temperature, using an equipment Shimadzu DSC-50, membranes samples were sealed in aluminum cell and heated up with rate of 5 °C/min with N2 atmosphere. The complex dielectric function measurements were obtained from a HP 4291A Material Impedance Analyzer in conjunction with to HP 4194 Impedance Analyzer, which jointly cover the region of 100Hz to 1.8GHz. Results obtained from shrinkage temperature of collagen membranes, casted in pH 7.4, showed that the native collagen membranes had higher thermal stability (78.33°C) than anionic collagen films (57.38 °C). The piezoelectric strain tensor element d14, the elastic constant s55, and the dielectric permittivity e11 were measured for the native collagen and anionic collagen films. Resonance measurement of the piezoelectric strain constant d14 of native collagen film gives 0.066 pC/N, while samples of anionic collagen obtained with alkacaline treatment give 0.072 pC/N. We believe that alkaline treatment lead to an increase of the organization of the microscopic structure of the sample, which could result in an increase of the piezoelectricity.

BIOFÍSICA (Física Médica e Biologia Experimental) – 13/05/99

[13/05/99 - Painel - 14:00]

ALTERAÇÕES MORFOLÓGICAS DE ESMALTE DENTAL IRRADIADO COM Nd:YAG E DIFERENTES INICIADORES

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O objetivo deste trabalho foi estudar as alterações estruturais ocorridas na superfície do esmalte dental, onde se aplicou o laser de Nd:YAG, na presença de mediadores cromóforos, ou seja, de pigmentos que tem a finalidade de aumentar a absorção do feixe de laser para o interior da estrutura dental com menor aquecimento dos tecidos circunjacentes ao tecido irradiado.

Os pigmentos testados, absorvedores do comprimento de onda laser, deveriam além de promover a fusão superficial do esmalte dental, serem de fácil remoção dos sulcos e fissuras da superfície oclusal após a irradiação. Foram testados 4 tipos diferentes de corantes: tinta nanquim, delineador hidrossolúvel para maquiagem de olhos à base de óxido de ferro, um corante evidenciador de placa bacteriana e carvão pulverizado, com granulação de 10μ m, misturado à água e álcool.

Foram usadas diferentes densidades de energia : 60 mJ e 10 Hz; 60 mJ e 15 Hz; 80 mJ e 10 Hz e 80 mJ e 15 Hz.. Ao exame no Microscópio Eletronico de Varredura os melhores resultados foram obtidos com carvão pulverizado misturado com água e álcool, a uma densidade de energia de 60 mJ e 10Hz e aplicação do pigmento fotoabsorvedor, seguido da aplicação do laser, por tres vezes.

Este pigmento se mostrou o mais fácil de ser removido dos sulcos e fissuras e apresentou os requisitos de fusão e recristalização superficiais do esmalte dentário, sem a presença de trincas.