
Refraction index determination of hair streams using optical coherence tomography technique

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Optical Coherence Tomography (OCT) is an interferometric technique that is of particular importance in the medical field, mainly due to its non invasive characteristic, non ionization radiation and also low price. Because of such characteristics carried by this technology as its high transversal resolution, OCT's uses have been spreading beyond medical applications. OCT with micron resolution allows tiny and delicate structures precise study such as hair stream. Hair streams have about 70 microns in diameter, in such a manner that the cosmetic field can also take advantage of this technology by evaluating physical and optical effects caused in the hair streams by the chemical treatment. The present work uses OCT to determine the medium refraction index of 2 different hair groups, blond and Caucasian ones, with 30 selected streams in each group. The physical diameters of the samples were measured next to the hair root by means of a diffraction method, and so their optical path by means of the OCT technique, so that the refraction index could be obtained. To validate the method, a BK-7 glass sample with known thickness was measured with OCT and then its refraction index was calculated and compared with the theoretical value showing accordant results.