

# ENCONTRO NACIONAL DE QUÍMICA FORENSE

Departamento de Química - FFCLRP - USP

**1<sup>o</sup> EN  FOR**  
10 a 13 de Dezembro de 2008    Ribeirão Preto - SP  
1<sup>o</sup> ENQ<sub>FOR</sub> - ENCONTRO NACIONAL DE QUÍMICA FORENSE

<http://sites.ffclrp.usp.br/enqfor/>

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Cerimônia de abertura do 1º ENQFor 2008.



### Background on Fiber Examination

Non-destructive techniques  
 Preliminary examinations by microscopy, scanning electron microscopy (SEM) and infrared spectroscopy.

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#### Traditional Approaches to Chemical Analysis

- Fibers that cannot be distinguished by non-destructive tests are submitted to further analysis with respect to chemical composition.
- Chemical analysis of fibers is often done by completely destroying them, often by using destructive techniques.

#### Color tests

- Large amounts of textile fibers are produced each year in millions of fiber types and colors.
- Many hundreds of commercial dyes are used in the textile industry with indistinguishable colors.
- Minimal structural variations are emphasized by the dyeing process and commercial composition.

#### Analysis of fiber samples

- Absorption spectroscopy in the ultraviolet (UV), visible (VIS) and/or infrared (IR) wavelengths regions.
- Separation of extract components by thin-layer chromatography (TLC) or high performance liquid chromatography (HPLC) (relative to one or more of the dyes) is often used.
- Main disadvantages: lack of selectivity and destructive techniques.

#### Emerging Techniques for the Analysis of Fine Fibers in Forensic Science

- HPLC with refractive index detector and column switching (HPLC-RI) or HPLC with fluorescence detection (HPLC-FLD).
- Surface Enhanced Raman Spectroscopy (SERS).

#### SEM/EDS

- Extremely powerful technique to determine chemical composition of fibers and their morphology.
- It provides information in the micrometer area, which is the main advantage in the analysis of fibers.
- Main disadvantage: destructive techniques.

#### FTIR and Raman Spectroscopy

- FTIR and Raman spectroscopy are powerful techniques to identify fibers.
- Main disadvantage: relatively poor sensitivity and fluorescence background interference in the analysis of lightly dyed fibers.

#### SEM

- Use of silver or gold coating to improve SEM image background and prevent human error.

Comitê de Química da FFCLRP apresenta:  
**NACIONAL DE QUÍMICA FORENSE**  
 Dezembro de 2008 – C. Convenções RP

Apresentação do Prof. Andres



Pela cara, o Prof. Marcelo deveria estar aprontando alguma...



Na seqüência: Ana, Thiago, Glauco e Ju, foram parte valiosa da equipe de apoio do evento.



Primeiro ENQFor: Sucesso de público e de crítica.



Apresentação do Dr. Jorge Zacca, da Polícia Federal



Prof. Barnes registrando tudo.





Prof. Andres e Prof. Fernando em nosso coquetel de abertura



Na seqüência: Profa. Márcia, Prof. Barnes, Dr. Jorge e Profa. Carmen.