

Study on Fourier Transform Infrared Spectra of Long-chain n-alkyl Fatty Acid Homolog

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Abstract

The infrared absorption spectra of fourteen compounds of the solid long-chain n-alkyl fatty acids have been measured and studied by 170SX FT-IR spectrometer. The results of the experiment showed that intervals of the band progression between $1180-1325\text{cm}^{-1}$ are not equal exactly. It has been found that there are regular relation between the wavenumber positions of absorption bands ($1180-1325\text{cm}^{-1}$) and the numbers of methylenes of the molecules, and the band positions can be predicted by using these relations. Six experimental formulas have been set up and band positions of 7 long chain n-alkyl fatty acids (C_{21} , C_{23} , C_{25} , C_{27} , C_{28} , C_{29} , C_{30}) have been predicted. The displacement of the absorption bands and the tentative assignment of the bands ($1180-1325\text{cm}^{-1}$) have been discussed as well.

Keywords: Fourier transform; FTIR long-chain n-alkyl fatty acid; band progression; methylene.

来稿摘登

真菌的扫描电镜样品制备

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电子显微镜在当代真菌的研究中应用日益普遍,真菌学家不断用电镜研究各种真菌的形态学、分类学、细胞学和发育学的各个方面。但国内目前应用于真菌的研究尚在起步阶段,经验不多,菌体在制样的过程中非常容易变形。据我们的多次实验结果,真菌用戊二醛、锇酸双固定,乙醇脱水,醋酸异戊酯过度,真空干燥的方法较为理想。

具体步骤和方法,取样、固定,脱水、过度按扫描电镜制样的常规方法处理。将过度后的样品仍保留在称量瓶内,在瓶内存留的醋酸异戊酯应盖过样品面,然后放入真空干燥仪的钟罩内。慢慢开排气阀,排气30分钟,其真空度在 1×10^{-3} 毛左右关闭排气阀。在该真空度下保持1小时,让瓶内的醋酸异戊酯在真空状态下蒸发掉而达到干燥的目的。最后将充气阀慢慢打开,使钟罩内成大气常压的状态,并将样品取出。干燥后的样品用导电性胶粘于扫描电镜的样品台上。在 IB-5 型离子溅射仪中进行金属镀膜,其厚度为200 Å 左右。在 JSM-25S 扫描电子显微镜中观察。使用电压为12.5千伏。

经戊二醛、锇酸双固定,乙醇脱水,真空干燥的菌丝体,孢子及孢子梗的形态均保持完好。另外,使用真空干燥法不会使菌丝体发生波动而使孢子脱落。但由于采用液体固定剂和脱水剂处理,所以在更换溶液的过程中应轻慢操作,以免孢子脱落。脱水剂的浓度梯级要密,而且更换脱水剂时不能吸得太干。真空干燥时排气和充气的速度不能太快,以免钟罩内的气压改变太快而有损于菌体的形态。

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