

Study on the Fluorescence spectra characteristics and Growth curve of Escherichia coli

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Abstract:Using fluorescence spectroscopy to study the luminescence properties of Escherichia coli(E. coli), using principal component analysis techniques to find the most important elements and structures in E. coli spectra, simplifying experimental data, finding the most accurate substances affecting the luminescent properties of E. coli, and exploring E. coli in water environment. The lowest detection line in the field, innovatively used fluorescence to characterize the growth curve of E. coli.The experimental results showed that the E.coli has two obvious characteristic emission peaks at 332 nm and 425 nm respectively with the excitation light of 289 nm. The intensity of characteristic emission peak decreases with the decrease of E.coli concentration. The detection limit of E.coli in water is 16 CFU/ml. The growth characteristics of E.coli in the delay, logarithmic, stable and decay phases were characterized by using the fluorescence spectrum of E.coli in different culture periods. The characteristics of E.coli growth curve were deduced from the fluorescence spectrum curve. This work is valuable for the detection of E.coli in atmosphere, water, food, and so on. It also have benefit for the study of the growth characteristics of fungi.