

**Effect of micelles on  $pK_a^*$  of acridine: a spectroscopic study**

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**Experimental details**

Surfactants and acridine were purchased from Sigma-Aldrich and used without further purification. A series of stock buffer solutions with pH from 7.0 to 12.5 with a step of 0.5 was prepared. Ammonia nitrate  $NH_4NO_3$  and sodium hydroxide NaOH (LenReaktiv, Russia) were used without further purification. Deionized water (DI water) was obtained by passing it through the Akvalab AL Double purification system (Mediana-Filter, Russia). The water quality was monitored using an Expert-002 conductometer (Econix-Expert, Russia) with a bulk-type sensor. The electrical conductivity was  $<1 \mu S cm^{-1}$ . The pH value of solutions was monitored using an Expert-001 pH meter (Econix-Expert, Russia) equipped with an ESK-10601/7 combined pH electrode (Izmeritel'naya Tekhnika, Russia). The concentration of stock buffer solution was 0.6 M. The stock solution of acridine was prepared with a concentration of  $10^{-4}$  M.

The analyzed solution was prepared by mixing the stock buffer solution with acridine stock solution and DI water in the ratio 1:1:1. To prepare the solution with the surfactant, the DI water part was replaced with the corresponding surfactant solution; the volume ratio did not change. The resulting concentration of the buffer in all solutions was 0.2 M, the concentration of the indicator was  $6 \times 10^{-5}$  M and the resulting concentration of surfactant was 1.5 of critical micelle concentration (CMC) for all surfactants under investigation to ensure the presence of micelles in solution. The absorption spectra of solutions were measured on a DT-MINI-2-GS compact spectrophotometer (Ocean Optics, United States). The  $pK_a^*$  value was calculated by processing the spectra measured on a Cary Eclipse fluorescence spectrophotometer (Agilent Technologies, United States).