



Spot test on paper for quantitative determination of chloride in tap water

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The spot test on paper for quantitative determination of chloride has been developed using a drop of sol-gel without silver nitrate to control reaction area. A 10 μL of sol-gel solution is spotted on a filter paper. Allow to dry for 30 minutes. Then each 10 μL of 0.018 M silver nitrate solution and sample solution are applied on the sol-gel spot, respectively. The gray-purple color on tested spots are recorded by a scanner. The intensity of light can be evaluated by ImageJTM program and the Euclidean Distance (ED) is calculated. The calibration graph plotted between Euclidean Distance and concentration of chloride standard solution is linear in range from 15 to 75 mg Cl⁻/L. The linear equation is $ED = 0.6746[\text{Cl}^-] + 9.5453$ ($r^2 = 0.9993$). The chloride results analyzed by this developed method and the titrimetric standard method were not significantly different at 95% confident interval ($n = 3$, $t_{\text{cal}} = -0.93$ and $t_{\text{table}} = 4.30$).

Keywords: Sol-gel; Spot test; Chloride; Silver nitrate; Colorimetric method