**A new application of µPADs in the gold industry :cyanide titration of pulp samples**

Akram Hajiniaa, Tahereh Heidari a\*

a Department of Chemistry,Faculty of Sciences,Ferdowsi University of Mashhad, Mashhad,Iran \*taherehheidari@um.ac.ir

Rapid and simple cyanide titration was accomplished using a microfluidic paper-based analytical device (μPAD). The device can separate water from whole pulp and quantify cyanide in a single step. The μPAD was fabricated by drawing with eye pencil[1] and consisted of ten reservoirs for reaction and detection. The reaction reservoirs contained various amounts of a titrant, silver nitrate( AgNO3 ),whereas a constant amount of p-dimethylaminobenzalrhodanine was added to all the detection reservoirs[2]. A sample pulp (40% solid) containing cyanide was dropped on to the center of the μPAD and was allowed to separate solid from water and spread of solution to the reaction reservoirs where the AgNO3 reacted it. When the amount of cyanide exceeded that of the AgNO3 in the reaction reservoirs, unreacted cyanide ion penetrated the detection reservoirs, resulting yellow color in the detection zone.Therefore, the number of the detection reservoirs with color change from yellow to pink determined the concentration of the cyanide in the sample pulp. The filtration and titration was completed within 1 min by visually determining the end point, which required neither instrumentation nor software[3,4]. The volumes of the AgNO3 and rhodanine solutions added to the corresponding zones were optimized to obtain reproducible and accurate results for the concentration of cyanide. The analysis results of pulp samples from gold factory using the μPAD agreed well with those obtained by classic titration.

References

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