Simple and sensitive method for the determination of methylmercury in hair using thin-layer chromatography with thermal decomposition gold amalgamation atomic absorption spectrophotometry

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Thin-layer chromatography（TLC）is a simple, cost-effective chromatographic method for high-throughput separation based on differences in the retention behaviors of the sample components. This study focused on improving a TLC method based on dithizone extraction using less-toxic solvents than those employed in the existing techniques, modern TLC plates, and TDA AAS. The proposed method was an optimized dithizone extraction and application procedure. It successfully detected methylmercury in hair samples, reaching a LOD of 0.18 ng of MeHg as Hg （0.018 mg MeHg kg^{-1} of hair from a 10 mg sample）. This performance satisfies the human biomonitoring requirement for evaluation established by the Minamata Convention on Mercury.

Summary of the analytical parameters for TLC-TDA AAS

LOD (mg MeHg kg^{-1} as Hg) using a 10 mg hair sample	0.018
Accuracy (Recovery) (%)	99-102
Repeatability (%)	<3.3
Intermediate precision (%)	3
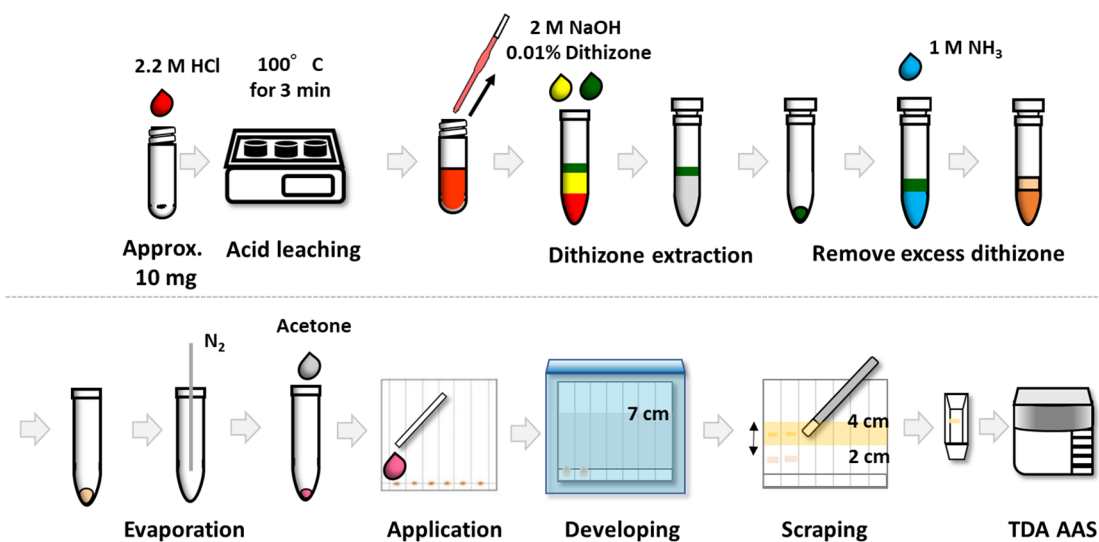
Analytical procedure for methylmercury determination in hair using TLC-TDA AAS