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## Determination Of Aluminum In Serum And Plasma By Electrothermal Atomic Absorption Spectrometry: A Comparison Between Zeeman And Continuum Background Correction Systems

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Elevated concentrations of aluminum (Al) in human serum can cause serious health problems in people with impaired renal function, especially those on kidney dialysis. Adverse health effects such as dialysis encephalopathy, cognitive damage, adolescent learning disabilities, infant brain function impairment, brain damage of exposed workers, and Alzheimer's disease are associated with Al exposure. Electrothermal atomic absorption spectrometry (ETAAS) is a popular technique for assessing exposure via serum Al measurements. Analytical performance of three ETAAS instruments with different background correction systems was compared for the determination of serum Al levels in human reference samples. Transferability of an established method for serum Al determination was explored for the Model 3110 AAS. The 3110 was found to be a more sensitive instrument, with a characteristic mass ( $m_0$ ) of  $12.1 \pm 0.6$  pg, followed by the Z5100 ( $m_0 = 16.1 \pm 0.7$  pg), and the 4100ZL ( $m_0 = 23.3 \pm 1.3$  pg). Instrumental detection limits were 3.0, 3.2, and  $4.1 \mu\text{g L}^{-1}$  for the Z5100, the 4100ZL, and the 3110, respectively, while the corresponding method detection limits were found to be 9.8, 6.9, and  $7.3 \mu\text{g L}^{-1}$ . Serum and plasma reference materials were analyzed to assess the accuracy and precision of the three instruments. Average sample values measured for each AAS were within established tolerance limits throughout the analyses. No statistically significant differences were noted between any of the instruments for either accuracy or precision. Results obtained suggest that all three AAS instruments are viable options for routine clinical serum Al analysis.