# Ti Application Note No. T- 21

| **Title:** | **Sn(II) and sulphuric acid in tin plating bath** |
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| ***Summary*:** | Determination of Sn(II) and sulphuric acid in an acidic tin plating bath by potentiometric titration. |

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| ***Sample:*** | Acidic tin plating bath |

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| ***Sample Preparation:*** | none, see under «Analysis» |

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| ***Instruments and Accessories:*** | 702, 716 or 736 Titrino or 726 Titroprocessor,<br>6.0431.100 Pt Titrode and 6.0219.100 combined glass electrode |

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| ***Analysis:*** | **Determination of Sn(II):**<br>Pipette a corresponding sample volume into a beaker, add 50 mL oxygen-free dist. water and titrate under nitrogen with $c(I_2)$ = 0.05 mol/L using the Pt Titrode.<br><br>**Determination of $H_2SO_4$:**<br>Pipette 2.00 mL sample into a beaker, add 50 mL $BaCl_2$ solution and titrate with c(NaOH) = 1 mol/L using the combined glass electrode. |

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| ***Calculation:*** | g/L Sn(II) = EP1 * C01 / C00<br><br>g/L $H_2SO_4$ = EP1 * C02 / C00<br><br>EP1 = titrant consumption in mL<br>C00 = sample size in mL<br>C01 = 5.9345 (Sn(II) equivalent in mg/mL; 1 mL $c(I_2)$ = 0.05 mol/L corresponds to 5.9345 mg Sn(II))<br>C02 = 49.037 ($H_2SO_4$ equivalent in mg/mL; 1 mL c(NaOH) = 1 mol/L corresponds to 49.037 mg $H_2SO_4$) |

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| ***Remarks:*** | If Sn(IV) also has to be determined the sample solution is prepared as follows:<br>Pipette a corresponding sample volume into a beaker, add 40 mL $c(H_2SO_4)$ = 2 mol/L and ca. 0.1 g Al powder and stir until the Al has completely dissolved, then titrate as described under «Determination of Sn(II)». The hydrogen produced in this way reduces all the Sn(IV) to the divalent state. |