

# Determination of Calcium and Potassium with Flame-AAS



Alfred Fürst



**BFW - Forest Foliar Co-ordinating Centre**

# 10th Ringtest - Calcium

- 05(>>>)  $\text{HNO}_3 + \text{HClO}_4$  & **AAS flame technique**
- 13(<<<<) Microwave  $\text{HNO}_3 + \text{HClO}_4$  & **AAS flame technique**
- 30(<<<<) **aqua regia extraction** & **AAS flame technique**
- 36(<<<<) Microwave  $\text{HNO}_3 + \text{H}_2\text{O}_2$  & **ICP-AES**
- 76(<<<<) Microwave  $\text{HNO}_3 + \text{H}_2\text{O}_2$  & **ICP-AES**



# 10th Ringtest - Potassium

- 01 (>>>>) *old AAS flame technique, contamination?*
- 02 (<<<<) Microwave  $\text{HNO}_3 + \text{HClO}_4$  & ICP-AES
- 13 (>>>>) *Small changes in the determination method (AAS flame technique)/find correct results*
- 19 (<<<<) *dilution and data transcription error*
- 30 (<<<<<) **aqua regia extraction & AAS flame technique**
- 74 (<<<<) Microwave  $\text{HNO}_3 + \text{H}_2\text{O}_2$  & **AAS flame technique**
- 79 (<<<<<)  $\text{HNO}_3 + \text{HClO}_4$  & ICP-AES



# Calcium Interferences

- Flame- AAS & ICP-AES Matrix adapted standards and blanks (same acid concentration; especially for  $\text{HClO}_4$  and  $\text{H}_2\text{SO}_4$ ) to prevent chemical and physical interferences
- Flame-AAS (Air/ $\text{C}_2\text{H}_2$ ) buffer against chemical interference with P, Al, Si for Calcium (10g/l high pure  $\text{La}^{2+}$  – added to blank, standard and samples) or use of a  $\text{N}_2\text{O}/\text{C}_2\text{H}_2$  flame

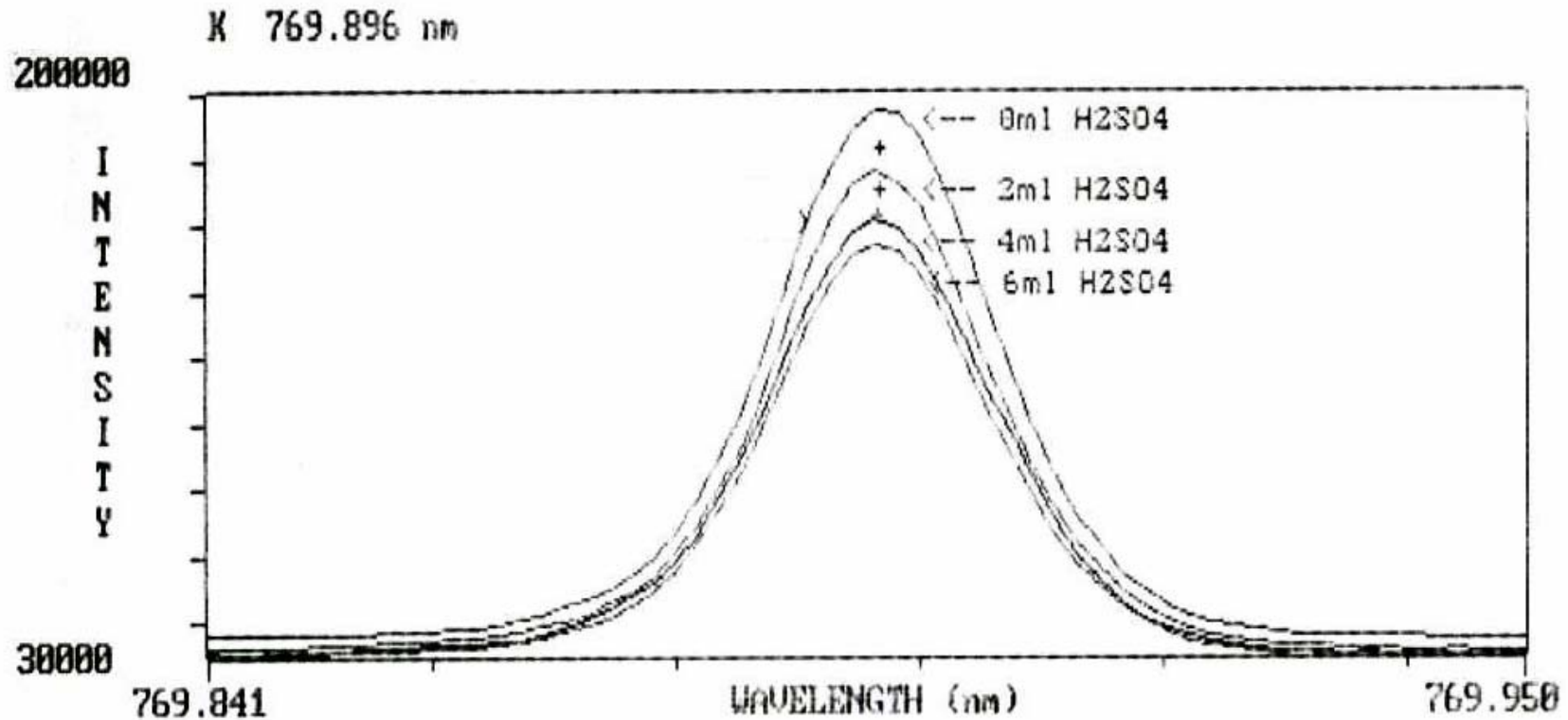


# Potassium Interferences

- Flame- AAS & ICP-AES Matrix adapted standards and blanks (same acid concentration; especially for  $\text{HClO}_4$  and  $\text{H}_2\text{SO}_4$ ) to prevent chemical and physical interferences
- Flame-AAS (Air/ $\text{C}_2\text{H}_2$ ) light ionisation interference is possible - ionisation buffer for Potassium (1g/l high pure  $\text{CsCl}$  – added to blank, standard and samples)
- 769.9 nm AA-line shows a better linearity than the 766.5 nm line



# Matrix adapted standards (ICP-AES)



40ppm K 0 - 6 ml H<sub>2</sub>SO<sub>4</sub>/100ml



BFW - Forest Foliar Co-ordinating Centre