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Determination of Impurities in Fine Ceramics by Inductively Coupled Plasma Atomic Emission Spectrometry

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Synopsis :
ICP-AES has been applied to the simultaneous determination of impurities in fine ceramics. Boron nitride and aluminum nitride were digested by acid pressure decomposition in Teflon vessels. Zirconium oxide was decomposed by fusion with the mixture of sodium carbonate and sodium borate. A micro-injection technique enables the measurement of these high salt containing solutions without clogging, and permits the use of a single calibration curve with background correction. The proposed method, which is able to determine low concentration in the level of ppm, is useful for the quality control of raw materials and products.

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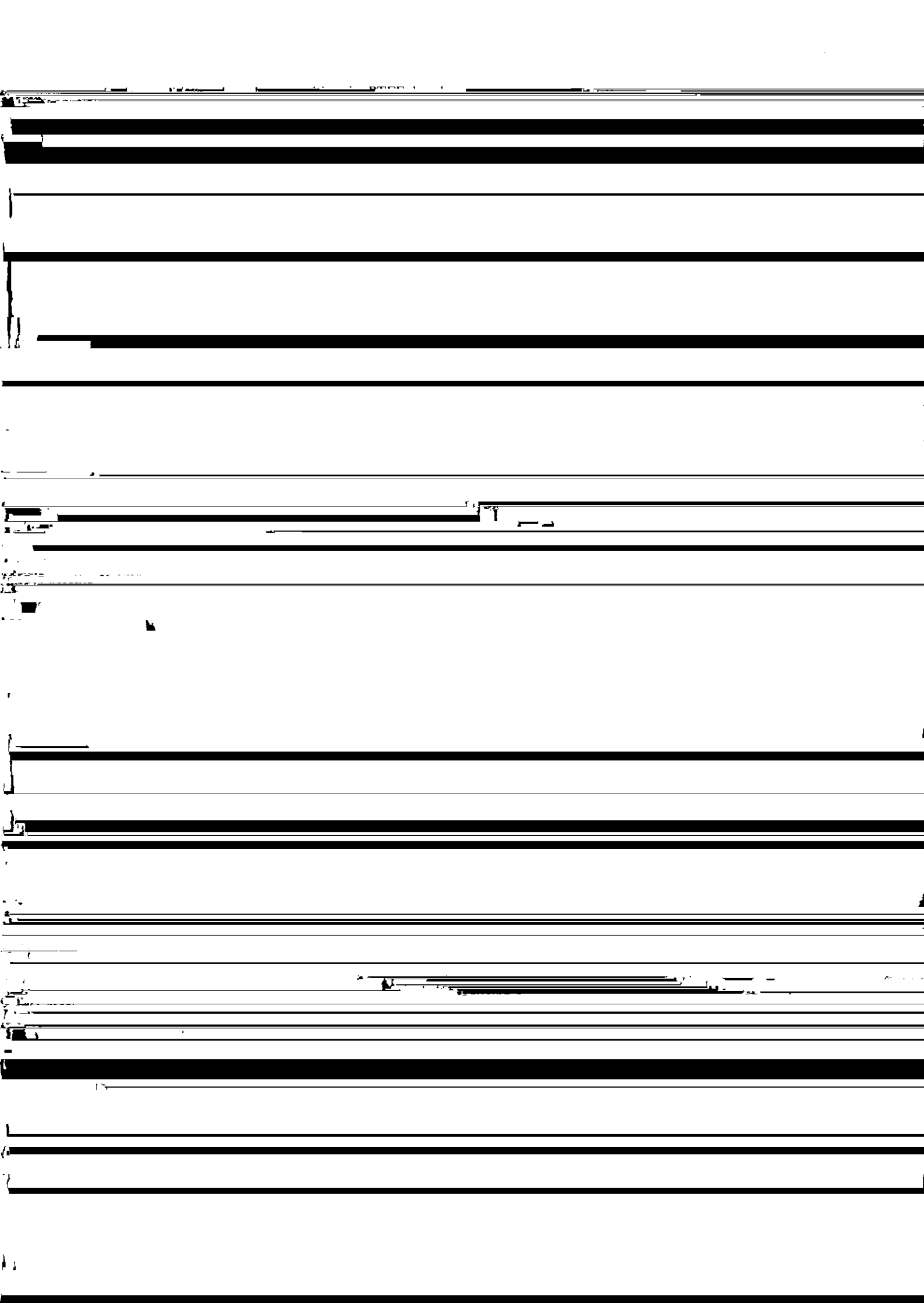
Synopsis:

ICP-AES has been applied to the simultaneous determination of impurities in fine ceramics. Boron nitride and

method using an ICP-AES, taking BN, AlN and ZrO_2.



(1 + 4), (3 + 2) were used, complete decomposition was

Element	Wave length (nm)	Interference*1
Fe	259.94	Al, Zr (B, C, increase)

Zr (ZrO_2 0.5 g/100 ml)

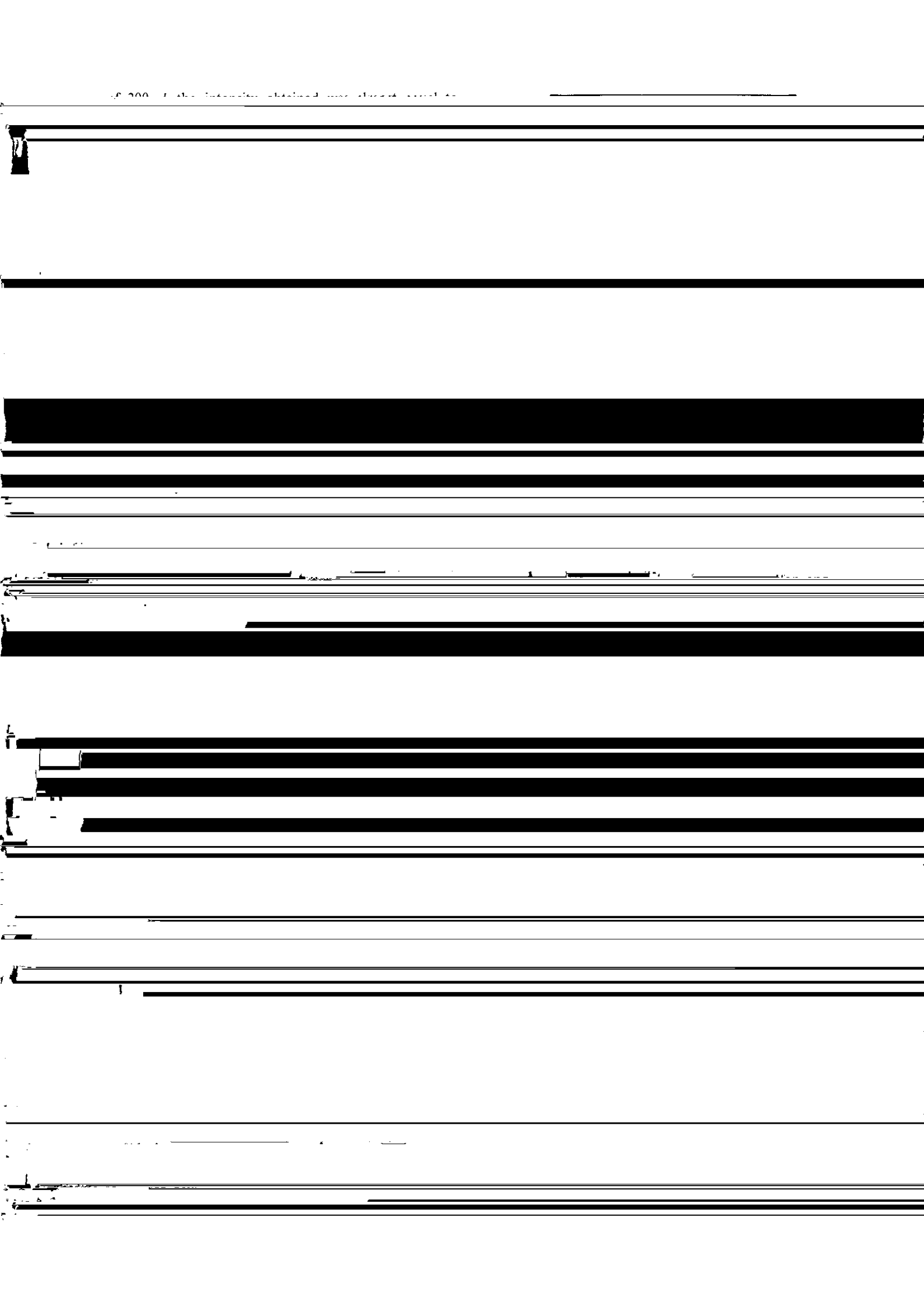


Table 6 Analytical results for zirconium oxide samples (%)

Sample		Hf	Y	Si	Al	V	P	Ti	Ca	Mg	Fe
A	$\bar{x}$	1.673	0.0024	0.0051	0.0021	0.0005	0.0007	0.022	<0.0001	<0.0001	0.083
	σ	0.001	0.0001	0.0005	0.0003	0.0001	0.0001	0.0007	—	—	0.002
[redacted]	$\bar{x}$	1.653	0.0007	0.011	0.0071	0.0006	<0.0001	0.015	0.0088	0.0023	0.0020

Note (1) $N=5$