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Improvement in Sample Preparation Equipment for Chemical Analysis in Steelworks

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Synopsis :

This report is concerned with the improvement and automation of sample preparation equipment in the analysis system for enhancing efficiency of analysis operation in the steelworks. Examples of improvement and automation of sampling are as follows: An automatic sampler for the on line analysis of plating solutions, swift sampler for continuously -cast slabs, BF slag sampler requiring on sample preparation, and sampler of white pig iron. Improved methods of sample preparation are as follows: Automatic sampler for the oxygen analyzer, automatic sampler of molten steel, sieving machine for collecting powdery samples, and centrifugal pressure mill. These samplers and sampling metho• e c

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**for Chemical Analysis in Steelworks**

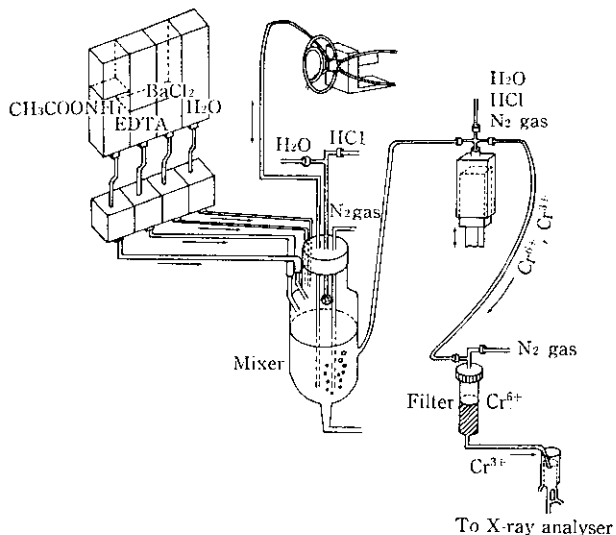


Fig. 1 Automatic separator of  $Cr^{3+}$  from chromate solution for the X-ray analyser

Fig. 2 は、ICP 発光分光分析を用いたティンフリースチールラインのメッキ液類オンライン自動分析用のサンプラーを図示したものである。この図の V、L、V' は、メッキ液類の試料、標準液、試料液の注入ポートを示している。

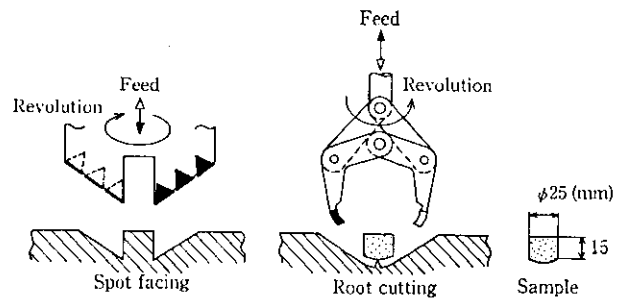


Fig. 3 Sampling method by hot slab sampling device

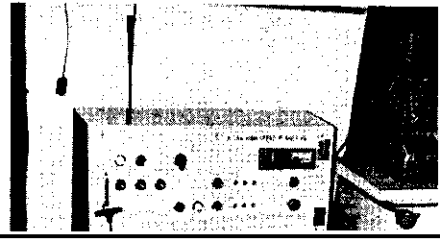
### 2.3 X線分析用の試料調製不要な高炉スラグサンプラー

製鉄・製鋼分析の作業負荷と分析所要時間の半減化計画の1つとして、スラグのX線分析用の試料調製不要なサンプラーの開発に取り組んできた。数年を費やして高炉スラグサンプラーを完成した。Photo 1 は、サンプリングモールドと平滑な分析面を得るための多孔質カーボンプレートとヤトバ採取用サンプラーでスラグ

このサンプリング方法は、溶銑桶中の溶融スラグを鉄製の杓で汲み出し、スラグサンプラー（モールド）に流し込む。その後、手早

Table 1 Comparison of analytical results of BF slag between briqueting sample and molding sample (%)

	Briqueting sample (%)	Molding sample (%)
SiO <sub>2</sub>		
CaO		
MgO		
Al <sub>2</sub> O <sub>3</sub>		
FeO		
MnO		
P <sub>2</sub> O <sub>5</sub>		
S		
Na <sub>2</sub> O		
K <sub>2</sub> O		
Loss on ignition		



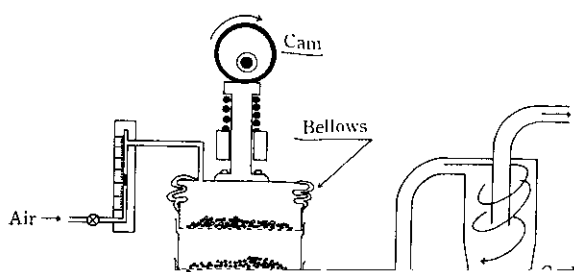


Table 4 Results of the crushing of lime stone, clinker and sinter ore using the centrifugal power mill (170 mmφ)

	Charge		Yield for each size of collection (%)					Types
	Size (mm)	Weight (g/2.5 min)	177~149 μm	149~105 μm	105~88 μm	88> μm	total	
Lime stone	-5.0	50.0	0.2	3.0	0.2	94.4	98.0	bottom fixed
Clinker	-3.0	50.0	0.2	2.2	1.4	96.0	99.8	bottom fixed