undissolved pozzolana has been reported by Lea[1]. The pozzolanas mentioned are natural pozzolanas and burnt kaolin. The applicability of this method for quantitative estimation of fly ash content in pfc was examined.

Samples of pfc having fly ash content ranging from 5 to 30 per cent by weight were prepared in the laboratory by intimately mixing weighed quantities of portland cement and fly ash. 0.5 g of each of the samples was stirred with 5 g picric acid and 30 ml methyl alcohol for 10 mins. After adding 20 ml distilled water, stirring was continued for 30 mins. It was then filtered and the residue washed with methyl alcohol, followed by warm water, dried and ignited at 1000°. The fly ash content was calculated from the weight of the ignited residue. The results obtained are given in Table 1.

TABLE 1—ESTIMATED AND ACTUAL C NTENTS OF FLY ASH IN DIFFERENT PFC SAMPLES

Sample No.	Fly Ash Content, per cent Estimated (a)	Actual (b)	a—b, %
1.	8.38	5.0	3.38
2.	10.56	7.5	3.06
3.	12.74	10.0	2.74
4.	15.10	12.5	2.60
5.	17.38	15.0	2.38
6.	19.55	17.5	2.05
7.	21.38	20.0	1.38
8.	23.64	22.5	1.14
9.	26.08	25.0	1.08
10.	31.06	30.0	1.06

A comparison of the estimated values with actual contents of fly ash in different pfc samples shows that (i) the test overestimates by 1.06 to 3.38 per cent and (ii) the mangitude of overestimation is higher at lower contents of fly ash. The overestimation is considered to be due to the fact that neither portland cement and gypsum are fully soluble nor fly ash is fully insoluble in picric acid-methyl alcohol solution as shown by the data in Table 2.

TABLE 2—SOLUBILITY OF DIFFERENT MARERIALS IN PICRIC ACID—METHYL ALCOHOL SOLUTION

Material	Solubility, %
Portland cement	97.52
Gypsum	91.21
Delhi fly ash	9.14
Faridabad fly ash	7.76
Neyveli fly ash	4.12

Commercially produced pfc normally contains 20 per cent or higher amounts of fly ash. At these fly ash contents the overestimation is only 1.38 per cent or less. This is permissible. The test can therefore be used for quick estimation of fly ash content in pfc sold in the market.

Acknowledgement

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Physico-Chemical Studies of Quinoline and 8-Hydroxy Quinoline Complexes of Blue Perchromate

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COMPLEXES of the blue perchromate with different organic nitrogenous bases have been studied by different workers.[1-7] Magnetic measurements of red and blue perchromates have been done by Tjabbes[8] and Klemm and Werth.[9] Bhatnagar, Prakash and Hamid[10] and Tomar, Singh and Singh[11] have measured the magnetic moments of the complexes of the blue perchromate. In the present communication quinoline and 8-hydroxy quinoline complexes of the blue perchromate have been studied. Chemical evidence has been supported by magnetic and I. R. Studies.

Experimental

Chemicals used were of A.R. Grade, Blue perchromate was prepared as described earlier.[5] Wiede's method (loc. cit) was used for preparing complexes of quinoline and 8-hydroxy quinoline.

Quinoline Complex : To 50 ml. cold ethereal blue perchromate. excess of quinoline was added. Dark brown ppt. was obtained on keeping the mixture overnight. The ppt. was filtered, washed with cold ether (till the filtrate was colourless) and then dried in a desiccator.

8-hydroxy quinoline complex : To 50 ml. of cold and ethereal blue perchromate excess of 10% ethereal solution of 8-hydroxy quinoline was added. A green ppt. was obtained immediately. The ppt. was filtered and washed with ether till the filtrate was colourless. It was then dried in a desiccator.

Estimation of the elements : Chromium was estimated as Cr_2O_3 by igniting definite weights of the complexes in a silica crucible. Nitrogen was estimated by Duma's method. Carbon and hydrogen were estimated by combustion method, while the amount of oxygen was determined by difference. Results are recorded in Table 1.

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TABLE 1—ANALYTICAL DATA

Name of Complex.	Appearance and Colour.	Proposed formula.	Percentage of element. Cr. Calc.	Cr. Found.	N Calc.	N Found.	C Calc.	C Found.	H. Calc.	H. Found.	O Calc.	O Found.
Quinoline.	Dark brown powder	$R_2Cr(CrO_{10})$	19.94	20.01	5.34	5.32	43.29	41.37	2.67	2.70	28.76	30.60
8-Hydroxy quinoline.	Green powder	$R_2Cr(CrO_{10})$	18.77	19.02	5.04	5.08	38.99	40.10	2.52	2.54	34.68	33.26

TABLE 2—MAGNETIC MEASUREMENT OF THE COMPLEXES.

Current passed 4.5 amp ; Temperature=27° ; $K_{air} = 0.028 \times 10^{-6}$; $K_{water} = -0.720 \times 10^{-6}$

Sl. No.	Volume susceptibility $K \times 10^{-6}$	Effective density (ρ)	Mass susceptibility $K' = K/\rho \times 10^{-6}$	Molar susceptibility $K_m \times 10^{-6}$	Number of Bohr Magnetic associated with the molecule. ($\mu\beta$)
		Quinoline Complex, $(C_9H_7N)\ CrCrO_{10}$			
1.	4.650	0.4463	10.35	5409	3.618
2.	4.650	0.4463	10.35	5409	3.618
		8-hydroxy quinoline complex, $(C_9H_6OHN)_2\ CrCrO_{10}$			
1.	4.503	0.4491	10.02	5551.08	3.667
2.	4.486	0.4491	9.984	5534.12	3.661

The values of Bohr Magnetons obtained in Col. 5 support the presence of Cr (III) in both the complexes.

Determination of oxidising powers of the complexes : Definite weights of the complexes were dissolved in minimum volume of *N*-NaOH solution and the solution was made upto a definite volume with distilled water. Oxidising powers of complexes were determined iodometrically as suggested by Tomar, Singh and Singh.[11]

Estimation of Chromium in the basic part and determination of the oxidising power of the filtrate : Chromium in the basic part of the complexes was estimated (i) Volumetrically and (ii) Gravimetrically as described by Tomar, Singh and Singh (loc. cit.). Oxidising power of the filtrate (obtained from gravimetric method) was also determined by the method used by the above workers.

This study suggests that Chromium is present in equal proportions in the acidic as well as basic parts of the complexes.

Magnetic measurements : Molar magnetic susceptibility (K_m) of the complexes was determined by Gouy's method at room temperature (Table 2).

I. R. Studies : Infra-red spectrograms of the complexes were obtained by using PERKIN-ELMER-MODEL 521 (4000 cm^{-1} to 250 cm^{-1})

Discussion

The observations made with the chemical and analytical studies of the complexes along with their behaviour in magnetic field and I.R. examination clearly show that (i) Both the complexes contain chromium in acidic and basic parts and the amount of the chromium in both the parts is equal (ii) The base molecule is attached to the blue perchromate molecule in both complexes (iii) On the basis of analytical data the probable molecular formula for both the complexes can be written as $R_2\ Cr(CrO_{10})$ where R stands for base molecule.

On examining the possibility of attachment of the base molecule in the two probable formulae for blue perchromate i.e. CrO_5 and $Cr_2(Cr_2O_{10})_3$, it seems quite probable in the latter formula as it has the necessary Cr(III) for complex formation. The study of these complexes, therefore, favours $Cr_2(Cr_2O_{10})_3$ formula for blue perchromate.

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Effect of Ring Size and 2-Methyl Substituents on the Rate of Elimination of Cycloalkyltosylates in Dimethyl Sulfoxide

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ELIMINATION reactions of alcohols,[1] alkylhalides[2] and alkyl tosylates[2,3,4] in dimethyl sulfoxide has been studied previously.[5] While some effort has been expended to reveal the mechanism by which the