rals occur in polysynthetically twinned crystals with an extinction angle varying from 25° to 36° and 2 V = 86° for andesine and 78° for labradorite. Andesine is optically negative and labradorite positive.

Rhombic Pyroxenes (Hypersthene and Enstatite) upto 34 per cent. These minerals have straight extinction, good cleavage. Hypersthene shows marked pleochroism. The 2 V for Hypersthene = 86° and it is optically negative. Enstatite is optically positive. The pleochroic formula for Hypersthene is: X = reddish; Y = pale yellow; Z = pale green.

Monoclinic Pyroxenes (Diallage mostly) below 20 per cent. with its usual characters.

Other minerals are biotite, magnetite and a few more accessories. Their chemical analysis reveals the following points:—

Chemical Analysis of the Rock

SiO_2 ..	50·30%	MgO ..	8·74%
Al_2O_3 ..	18·32%	CaO ..	9·37%
Fe_2O_3 ..	2·76%	Na_2O ..	1·86%
FeO ..	5·56%	K_2O ..	1·90%
TiO_2 ..	trace	Water ..	1·24%

Megascopically they are more or less coarse-grained granular, hypidiomorphic and black coloured. Sp. gr. varies from 2·93 to 3·1.

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Benares Hindu University, R. C. SINHA.
December 14, 1945.

TRACHYBASALTS FROM THE CUDDUPAH TRAPS (*PRE-CAMBRIAN*)

DURING the course of a detailed investigation of the igneous rocks associated with the Cuddupah sediments, a portion of which has already been published by the author,[1] an interesting variety of rock has been discovered near Royalcheruvu (Ananthapur District) which on examination shows extremely well-developed fluidal texture of microlites of felspar (*vide* Fig. 1). Such a rock with a definite trachytic texture had not been noticed so far from among the basic volcanic rocks of Cuddupah.

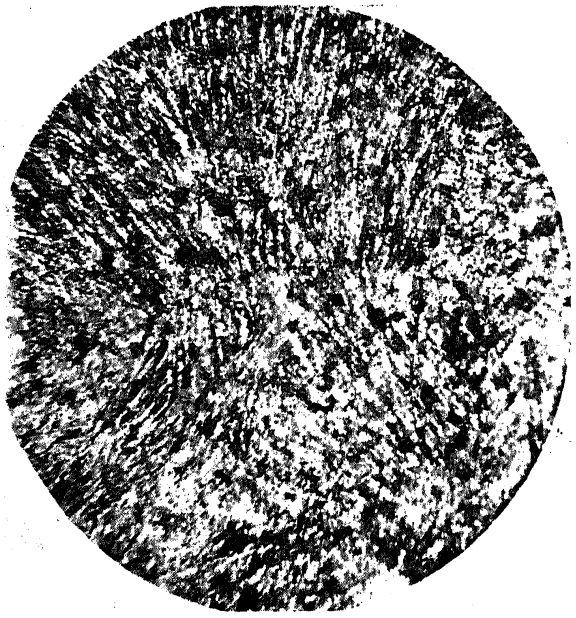

FIG. 1 × 45. Trachybasalt showing fluidal texture.

The sp. gr. of the rock is 2·9, rather much higher than the ordinary trachytes which usually show an average sp. gr. of 2·6. The rock is greenish grey in colour with a typical aphanitic appearance. Under the microscope it shows a colourless glassy groundmass with numerous microlites of felspar arranged in typical trachytic manner. Some of these show straight extinction and are, therefore, oligoclase microlites; while others, which are untwinned are orthoclase microlites. There are numerous colourless granules of augite, olivine and cubes of magnetite. A few corroded microphenocrysts of felspar with numerous inclusions have also been noticed. Though the texture is typically trachytic the rock is termed a trachybasalt on account of its high sp. gr. value and the basic character of the felspar microlites. On comparison, it is found to be almost similar to the mugearites described by Harker[2] from the Skye islands, and the trachybasalts described by W. Cambell Smith[3] from Kenya colony. The rock is being chemically analysed and the details will be published shortly.

Department of Geology,
Central College, M. R. SRINIVASA RAO.
Bangalore,
March 11, 1947.

1. Srinivasa Rao, M. R., "The composite sill of Jutoor, Cuddupah formations" *Mys. Uni. Jourl.*, 1945, **6**, 47. 2. Harker, A., *Tertiary Igneous Rocks of Skye*, 1904, 264. 3. Cambell Smith, W., "Trachytes and Phonolites from Kenya Colony." *Q.J.G.S.*, 1931, **87**, 253.

ELASTIC CONSTANTS OF ALUMS AND MIXED ALUMS

THE elastic constants of potassium alum, chromium alum and mixed alums of both of these of varying compositions by weight have been determined by using the wedge method developed in this laboratory.

Suitable single crystals have been grown from solutions and they all belong to the cubic system. 100, 110, and 111 sections of about 1 mm. thick are cut and ground; and frequencies ranging from 1 to 10 megacycles have been employed.

The following values for C_{11}, C_{12}, C_{44} in units of 10^{11} dynes/cm.^{2} are obtained in each case. Densities are determined by the author

No.	Substance	Percentage in gm. of pot. alum.	Density (gm/cm^3)	C_{11}	C_{12}	C_{44}
1	Potassium alum.	100	1·760	2·56	1·07	0·86
2	Mixed alum. ..	86·5	1·772	2·52	1·05	0·81
3	Do. ..	60	1·796	2·47	1·01	0·78
4	Do. ..	54·5	1·802	2·44	1·00	0·78
5	Chromium alum	0	1·845	2·37	0·93	0·77

and compositions of the mixed alums are deduced from the linear law of densities for isomorphic crystals.

In the literature, values of C_{11}, C_{12}, and C_{44} are available from Voigt's[1] work on potassium alum; and in the above units they are respectively 2·43, 1·009, and 0·843, comparing well with the results of the present investigation.

Department of Physics,
Andhra University,
Waltair. R. V. G. SUNDARA RAO.
February 28, 1947.

1. Voigt, W., *Gottinger Nachrichten*, 1918-19 Heft, I. 85.

BLOOD GROUPS OF PUNJABIES AND MALDIVIANS

OPPORTUNITY was afforded during the war to examine the blood groups of 2,500 Punjabies at the I.M.H., Rawalpindi, and of 211 Maldivians at Addu Atoll.

This Atoll is the southernmost of the Maldive group of islands and the inhabitants are Singhalese in origin. A considerable inbreeding has been going on for a few centuries and the total population is less than 2,000. Therefore 211 persons were considered to be fairly representative random sample.

Vincent's technique was followed to determine the groups. The frequency distribution of different groups was as follows:—

	O	A	B	AB	A/B ratio
Punjabies ..	34·8	24·5	33·3	7·4	0·7
Maldivians ..	58·3	17·5	21·8	2·4	0·8

Field Typhus Research Dett., S. L. KALRA.
GHQ. Med. Research Organisation,
Jubbulpore,
February 17, 1947.

TURBIDITY TEMPERATURE OF OILS AS DETERMINED BY BELLIER'S TEST AND ITS SIGNIFICANCE AS AN ANALYTICAL CONSTANT

THE solubility of oils in various solvents is a constant, depending on the nature of the glycerides composing the oil. In the Valenta test, acetic acid is used as a solvent. Fryer and Weston[1] found that a mixture of equal volumes of 92 per cent. ethyl alcohol and pure amyl alcohol can also be satisfactorily employed as a solvent for turbidity value. This turbidity value is the temperature at which the solution of oil in the solvent shows the first signs of turbidity on cooling.

There are two factors which, if not allowed for, entirely destroy the reliability of the estimation of solubility in the solvents. One is free fatty acids which lower the turbidity temperature, increasing the solubility of the oils. The other is moisture, which raises the turbidity temperature, decreasing the solubility. In the Valenta test preliminary operations, *viz.*, standardization of the solvents, preparation of oils, corrections for free acidity, moisture and acetic acid, etc., have, therefore, to be carried out.

In the case of soap and commercial fatty acid analysis the original glycerides are not available and, therefore, Fryer and Weston[2] investigated the turbidity temperatures obtained with the mixed fatty acids themselves with various solvents and proposed acetic acid of 90 per cent. strength as the most suitable solvent for the purpose and standardized as in the test for oils against pure oleic acid. The presence of small amounts of und composed glycerides in the mixed fatty acids raises the turbidity temperature considerably; it is, therefore, essential that a complete saponification is obtained before the test is made, and the mixed fatty acids from soap or as obtained commercially, should preferably be resaponified by alcoholic potash. These authors have suggested that in addition to its value in the analysis of soap and of commercial fatty acids, the test may be applied to oil analysis. It has the advantage that no correction for acidity is necessary as in the case of oils. A further advantage offered by this method is that the result is not influenced by the presence of moisture in the oil or in the acid as in the case of the turbidity test with the oil (Valenta test).

The turbidity temperature as determined by Bellier's test is also based on the solubility factor of the mixed fatty acids of the oils in 70 per cent. alcohol under prescribed conditions and is characteristic of a particular oil. The test was subsequently modified by Mansfeld, Alder and Franz and examined by Evers[3] who found the modification satisfactory. Fryer and Weston also confirmed this in their own experience and has described it in their *Technical Handbook of Oils, Fats and Waxes* (Vol. II, p. 140). This modified test has been used by the writer for judging the purity of oils and has been found simple, rapid and fairly accurate for routine analysis as compared to the Valenta test. The results are not affected by the presence of moisture in the oil and no corrections for free acidity, etc., are required as in the Valenta test. Moreover, it can be conveniently used in the analysis of soap and commercial fatty acids and also for determining the percentages of two mixed oils, if the range between the turbidity temperatures of these two oils is fairly wide, *e.g.*, groundnut oil and sesame oil, almond oil and sesame oil, etc. Other workers[4] have also successfully used the same test for determining adulteration of groundnut oil in some edible oils and also suggested its analytical importance. Besides, the turbidity temperatures obtained with fatty acids by the method of Fryer and Weston are different from those for the respective oils, depending on the difference in the solubility of the glycerides of the oil and its fatty acids in the same solvent. If the Bellier's test is employed for the same purpose, the turbidity temperatures obtained with oils and their mixed fatty acids are nearly identical as the