hydroxy group in III because an equatorial substituent is sterically less hindered than the same substituent at the same position linked through a polar bond[1].

A. K. Bose

Department of Applied Chemistry, Indian Institute of Technology, Kharagpur, India, July 28, 1952.

Zusammenfassung

Die «Conformation» aller Carvomenthole und Carvomenthylamine wurde auf der Grundlage der Vorstellung von polaren und äquatorialen Bindungen abgeleitet. Die Konfiguration von Carvomenthol, Neocarvomenthol, Carvomenthylamin und Neocarvomenthylamin, die aus ihrer «Conformation» folgt, ist identisch mit der Konfiguration, die von Read und Mitarbeitern hauptsächlich auf der Grundlage der von-Auwersschen Regel vorgeschlagen wurde. Die «Conformation» des Isocarvomenthols und des Isocarvomenthylamins lässt erkennen, dass sich alle Substituenten in diesen beiden Verbindungen in *Cis*-Stellung befinden.

[1] D. H. R. Barton, Exper. *6*, 316 (1950). – D. H. R. Barton and W. J. Rosenfelder, J. Chem. Soc. *1951*, 1048.

A Study of the Clay Fraction of Egyptian Soils

The soil of Egypt is formed from the Nile deposits resulting from the disintegration of the igneous rocks of the Ethiopian plateau due to the chemical and physical weathering factors.

The clay fraction is the active part of the solis. The properties of the different types of clay depend upon the following characteristics: (a) The size of the particles, (b) the chemical nature of the clay, i.e. its exchange reaction and the water-binding capacity, etc., and (c) the plate-like structure of the particles.

Material: The sample for this study was taken from the Faculty of Agriculture's farm situated at 30° 2′ N and 31° 13′ E in Giza about 0·8 km west of the River Nile.

Table I

The chemical analysis of H-clay, oven dry basis

Constituents	Percentage
SiO_2	56·52
Al_2O_3	25·32
Fe_2O_3	14·00
CaO	0·74
MgO	1·87
K_2O	1·60
Na_2O	1·48

The sample was placed in a high cylinder and a litre of distilled water was added. After the soil became thoroughly wetted, the mixture vigorously stirred and left for sedimentation. Afterwards, a syphon under the surface was inserted and the suspension was removed. The fine particles were leached with $^n/_{250}$ HCl several times to replace all the alkaline and alkaline earth ions with H-ions and consequently a pure clay sample was obtained. The sample was washed Cl-free with water and then electrodialysed.

Results: (1) *The chemical analysis.*—The chemical analysis of the H-clay produced was carried out by the fussion method[1]. The Table I gives the results.

The evaluation of the chemical analysis is very difficult owing to the presence of an amorphous part[2] mixed with the crystalline fraction. Also the continuous washing with water and HCl strongly reduced the alkaline content.

(2) *Exchange capacity.*—The exchange capacity of the clay was determined with $Ba(OH)_2$ after Wiklander[3]. 2–3 g of the clay were suspended in water and then 10 ml of $Ba(OH)_2$ were added. After equilibrium was reached, the Ba-clay was mixed with ion exchanger JR, amberlite 120 and the Ba-ion adsorbed was estimated as $BaSO_4$. Table II shows the absorbed milliequivalent Ba-ion.

Table II

Milliliter Ba-adsorbed/g H-clay air dried (9·98% H_2O)

Initial concentration in m.e.	m.e. adsorbed Ba^{++}
5·00	1·14
10·00	1·18

(3) *The electron micrograph*[4].—As the scattering in the electron microscope is proportional to the thickness and density of the sample exposed, it is necessary that the particles should be very fine and the film extremely thin and homogeneous.

For this study, the finest fraction was obtained as follows: lg of H-clay was suspended in water, peptized with NH_4OH[5] and then left some days for sedimentation. The sample for the electron micrograph was made by allowing a drop of the suspension to evaporate on a thin collodion membrane which was previously dried.

The electron micrograph shows an aggregated material with plate-like structure. The sample is made up of very thin plates mixed with thicker units. Fine particles of quartz are also easily seen together with the thicker undispersed units, which agree with Eitel's observations[6]. The electron micrograph classifies the Egyptian alluvium clay mineral with the illitic group.

(4) *X-ray analysis.*—Two powder diagrams[7] have been taken according to the Debye-Scherrer method with Fe-radiation $\lambda = 1{\cdot}93239$ Å, in a camera diameter of 114·4 mm.

The first diagram represents the original clay before leaching with diluted HCl, and the second one shows that of the H-clay. Table III gives the glancing angles and lattice-spacings of both samples.

[1] F. P. Treadwell and W. T. Hall, *Analytical Chemistry*, vol. 2 (John Wiley Inc., New York, 1945).

[2] H. Hamdi and M. Naga, Schweiz. Min. Petrogr. Mitt. *29*, 537 (1949).

[3] L. Wiklander, Anal. roy. Agr. College Sweden *16*, 670 (1949).

[4] The micrograph was taken in the Plant Physiology Department of E.T.H. Zurich. We express our thanks to Ing. R. Iberg for his kind help.

[5] C. W. Correns and W. Scott, Koll.-Z. *61*, 68 (1932) – C.W. Correns, Zbl. Min. Abt. A *321* (1934).

[6] W. Eitel, H. Müller, and G. Radczewsky, BDK. Ges. *20*, 165 (1939).

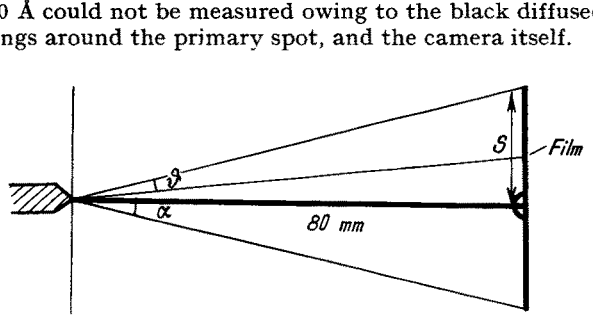
[7] The powder diagrams have been taken in the Min. and Petrogr. Institut of E.T.H. Zurich. We are indebted to Dr. W. Epprecht for his help.

Table III

X-ray diagrams after DEBYE-SCHERRER method

Before leaching with HCl			After leaching with HCl		
Intensity	ϑ	d(hkl)	Intensity	ϑ	d(hkl)
diffused ring	–	–	diffused ring	–	–
m.	12° 33′	4·44 Å	w.	11° 12′	4·97 Å
m.	16° 48′	3·34 Å	s.	12° 18′	4·47 Å
m.	20° 05′	2·82 Å	v. w.	15° 33′	3·60 Å
m.	22° 06′	2·57 Å	s.	16° 45′	3·33 Å
w.	28° 54′	2·00 Å	w.	17° 28′	3·22 Å
v. w.	32° 12′	1·81 Å	v. w.	18° 48′	2·99 Å
w.	34° 33′	1·70 Å	v. w.	19° 50′	2·84 Å
w.	35° 42′	1·656 Å	v. w.	20° 56′	2·70 Å
w.	38° 45′	1·543 Å	s.	22° 14′	2·56 Å
w.	40° 12′	1·497 Å	v. w.	23° 04′	2·46 Å
w.	48° 12′	1·296 Å	v. w.	26° 36′	2·16 Å
			m.w.	29° —	1·993 Å
			w.	34° 30′	1·710 Å
			v. w.	35° 39′	1·661 Å
			m.	40° —	1·503 Å
			w.	44° 27′	1·380 Å
			w.	48° 12′	1·296 Å
			v. w.	50° 36′	1·250 Å

Comparing the interference rings of this clay mineral (Table III) with those of the main clay mineral groups[1], it is obvious that the clay mineral of the Egyptian alluvial soils belongs to the Illite clay mineral group (Hydrous mica). Both diagrams, especially the first, show black diffused rings which indicate the presence of an amorphous part, easily soluble even in very diluted HCl. The basal interference for this clay mineral at about 10 Å could not be measured owing to the black diffused rings around the primary spot, and the camera itself.



In order to be sure of the presence of the amorphous part, another diagram with Cu-K radiation $\lambda = 1{\cdot}53736$ Å was taken in the following manner: A very thin tablet (0·3 cm thickness) of the H-clay was pressed and exposed to X-ray radiation. Behind the sample at a distance of 80 mm we arranged a flat film and thus got a DEBEY-SCHERRER Diagram for small glancing angles (see Fig.). Table IV gives the glancing angles and their spacing.

The diagram produced shows a clear diffused ring indication the presence of an amorphous substance. The situation of this diffused ring almost corresponds to that estimated by the DEBYE-SCHERRER method (Table III).

Also the untreated clay fraction of the Egyptian soils with HCl shows a clear black ring around the primary spot indicating the presence of an amorphous phase with the clay mineral illite. Its diameter varies between 26 mm and 33 mm with the average of 29·6 mm.

[1] G. W. BRINDLEY, *X-ray identification and crystal structures of clay-minerals* (The Mineral. Soc., London, 1951).

Table IV

X-ray diagram of H-clay with Cu-radiation

Intensity	S mm	tgα	α	ϑ	d(hkl)
diffused ring	–	–	–	–	–
m.	28·75	0·3618	19° 52′	9° 54′	4·47 Å
m.	54·50	0·6812	34° 12′	17° 06′	2·56 Å
v.w.	69·90	0·8736	41° 06′	20° 33′	2·16 Å
w.	78·80	0·9975	45° 00′	22° 30′	1·99 Å

The calculated spacings lie between 4·9 and 4·0 Å with the mean value of 4·4 Å.

The spacings of the clay mineral illite 4·90, 4·46 and 4·11 Å lie in the black ring and consequently could not be measured in this diagram.

Conclusion: According to our estimations the clay mineral of the Egyptian alluvium soils can be classified in the Illite clay mineral group (hydrous mica), and contain an amorphous part (gels) soluble in diluted HCl.

H. HAMDI and M. NAGA

Soil Science Department, Faculty of Agriculture, Fouad I University, Giza, Egypt, August 1, 1952.

Zusammenfassung

Die ägyptische Tonfraktion wurde durch Auswaschen mit destilliertem Wasser suspendiert. Die Behandlung mit Salzsäure wurde fortgesetzt, bis der Ton frei von Alkali- und Erdalkali-Ionen war.

Die chemische Zusammensetzung wurde nach dem Soda-Aufschluss-Verfahren ermittelt. Die Austauschkapazität wurde nach der Wiklander-Methode bestimmt. Sie beträgt 1,18 MA/g lufttrockener Ton. (9,98% H_2O). Die Elektronen-Mikroskop-Aufnahme, hergestellt nach der Methode von ARDENN, zeigt, dass der ägyptische Ton zu den glimmerähnlichen Mineralien vom Illite-Typ gehört (Hydroglimmer). Röntgenbeugungsaufnahmen nach der Debye-Scherrer-Methode zeigten durch Vergleich der Interferenzringe des ägyptischen Tons mit denjenigen von reinen Tonen, dass der Alluviumton den glimmerähnlichen Mineralien gleicht. Der Alluviumton enthält neben der kristallinen Substanz einen amorphen Anteil, der in verdünnter Salzsäure löslich ist.

Elektronenmikroskopische Blutbeobachtungen an mit Poliomyelitisvirus (Stamm Lansing) infizierten Mäusen

In früheren Mitteilungen (CARONÍA[1], MULÈ[2]) ist über die Resultate von elektronenmikroskopischen Beobachtungen am Blut von Poliomyelitiskranken in der akuten Periode der Krankheit berichtet worden. Es wurden runde und filamentöse Formen nachgewiesen.

Diese verschiedenen Formen wurden bei den an 10 Patienten ausgeführten Untersuchungen konstant angetroffen (MULÈ). Sie sind dem Blut von Poliomyelitiskranken eigen und wurden im Blut von normalen oder von anderen nicht durch filtrierbare Viren verursach-

[1] G. CARONÍA, Verh. II. intern. Poliomyelitiskongr. Kopenhagen, September 1951 (im Druck).

[2] F. MULÈ, Rend. Ist. Sup. Sanità *14*, 1000 (1951); *15*, 1020 (1952).