GECO
GEOPHYSICAL COMPANY OF NORWAY A·S
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MS/rr/62 lab

Sub.: Rock Mineral Analysis from well: 31/2-3.

As you can see from the report we did not get pure mica-, feldspar- and quartz fractions with the method used on the samples with highest content of mica. The results are estimated by means of microscope and the accuracy of samples with high mica content will differ from the others.

If you find that some of the methods used not satisfy your requirement concerning accuracy we are of course willing to do further work on the samples.

Very truly yours
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Discription of methods:

The most important minerals were quartz, feldspar, mica and clay minerals. Other minerals exist only as trace, but some had some coal. The composition are made with a technique based on separation of clayminerals by sedimentation, using heavy liquids and floatation to separate mica,feldspar and quartz.

The samples were split into two separate faces:

1. Samples with mica content from 1-4 percent, medium to coarse grains.

   These samples were easy to separate into pure fractions.

2. Samples with mica content from 10-35 percent, mostly fine grain size.

   These samples were not easy to separate into pure fractions.

Therefore the mineral composition of every fraction was made in an optical microscope and total amount of quartz, mica and feldspar were calculated based on the weight of every fraction compared to the estimated amount of the three minerals.

Detailed description of procedures are as follows:

Carbonates:

A small portion of sample was placed into a glass tube and added 20% hydrochloric acid. If carbonates are present they will occur as foaming of CO_2 - gas.

Clay minerals:

Preliminary studies on X-ray analysis showed that kaolinite was the most important claymineral. A sedimentation during one hour and fall height of ten centimeter was made to separate grains of 5,0 micrometers. A controll of that we had pure fractions was made on the 5 microns fraction by means of X-ray. Illite was determined with the same method, mica is included in this fraction.

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Mica with a grain size below 5 microns are included in the clay fraction, and Illite grains above this limit are included in the mica fraction.

Before sedimentation the sample have been treated 5 minutes in a ultra sonic bath and heated to 60° C with hydrogen peroxyde. From this we got the iron compounds which we removed by adding trace of hydrocloric acid. This is included in the clayfraction.

The amount of clayminerals were determined by weighing of the sample before and after the treatment and repeated until we got clear water above the sedimented minerals.

Heavy minerals:

The sample was mixed with tetrabromide (sp.w. 2.90) in a funnel. The fraction which sank was removed and weighted. The weight of this fraction as percent of total weight of sample before removing clay is given as heavy fraction. The colour varied from light to black and red. The composition of this fraction is not determined except that the red fraction has a high content of garnet.

Mica:

After heavy-liquid separation the samples were put into water added H_2So_4 - acid to pH 3.0, and floatated with amine to separate mica.

Some of the samples were difficult to separate mica probably because forming of Illite.

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Feldspar:

After mica floatation some hydrofluoric (HF) acid was added to pH 2.5 and also more amine. This methode separate feldspar from quartz. If trace of mica left it will also occur here.

Quartz:

The rest of the minerals have to be quartz. Running a X-ray on this showed that the fraction was pure, when the mica-poor samples are treated.

Concerning the other samples it was not possible to get pure fractions, but the amount of uncommon minerals are estimated optical and the amounts adjusted.

Results:

Sample	Carbonates %	clay %	Heavy Fraction %	Mica %	Feldspar %	Quartz %
1426,7	-	17,2	0,9	10	19	53
1438,1	trace	4,9	0,9	2	23	69
1455,0	-	8,4	4,8	1	12	74
1469,2	-	6,8	2,3	3	12	75
1473,0	trace	11,7	2,1	1	10	76
1485,5	-	10.9	1,5	25	21	41
1499,7	-	3,6	0,3	1	19	76
1517,2	-	11.6	0,1	35	12	40
1537,4	-	13,9	0,6	23	20	43
1552,8	-	15.2	0,4	31	14	40
1578,9	-	14.3	0.9	34	16	35
1608.1	-	10,4	1,0	22	21	45
1623,6		5.0	0.5	3	27	63
1638.0	-	23	0.1	29	18	29