

Unit 6

1. Learn, to pronounce the following words properly.

create [kri:'eIt]	satisfactory [s,ætIs'factɔrI]
silicate ['sIIIkIt]	maintain [men'teIn]
availability [ə'veIIə'bIIIItI]	encounter [In'kauntə]
vehicle ['vi:IkI]	combination [k,ɔmbI'neI](ə)n]
calcium ['kælsIəmə]	generate ['dʒenə'reIt]
requisite ['rekwIzIt]	

II. Translate the following sentences paying attention to the predicate in the Passive Voice;

1. She problem was discussed from the viewpoint of its practical importance.
2. The experiments conducted in the laboratory were followed by the discussion of the results obtained.
3. The development of oil industry was influenced by the increased demand for oil.
4. We were not told anything about the results obtained.
5. The equipment which, is needed, was sent for and, will be brought in some days.
6. The data which were referred to are not reliable.
7. The information spoken about can't, be relied upon.
8. The solution of the problem which was much spoken about at the last meeting can't be thought of at the present state of knowledge.
9. The man who is spoken to has developed the new method used at present.
10. The problem was discussed from different viewpoints because of great importance both theoretically and practically.

III. Translate the following sentences. Pay attention to the verbals:

1. We know this scientist to have designed this equipment.
2. We know of this scientist having introduced the new methods of recovery.
3. The students taking part in designing this machine will make reports at the conference.
4. Having designed this machine, he could make a report.
5. Having been designed, the equipment was introduced into industry.
6. When designed the equipment was introduced into industry.
7. The way of designing this equipment was very difficult.
8. By designing this equipment we shall make great progress.
9. It's necessary for us to know many data to design this equipment.
10. (When) Solving this problem, he learnt many new things.
11. After solving the problem he could design this equipment.
12. After being designed the equipment was used in oil industry.

IV. Read the text;

MUD

The " mud " is a name used for a combination of chemicals.. It is pumped through, the bit and then up to the surface through the annular space between the walls of the well and the drill-string. The mud lubricates and cools the bit and flushes out the chippings created while drilling and brings them to the surface where they are filtered out of the mud so that it can be used again. The chippings provide valuable information about the formation penetrated. Traces of oil and gas brought up can give the first hint of a discovery. In addition the mud lines the walls of the hole preventing it from caving in. The weight of the mud balances the formation pressure encountered during drilling.

DRILLING FLUIDS

I. Types of drilling fluids: Classification of drilling muds by generic name results in two mud systems, i.e. water-base and oil-base. Water-base muds are used much more extensively than the oil-base types, as the latter are primarily restricted to special purpose drilling. Water-base muds consist of a large number of separate systems since the only requisite to fall in this class is the use of water for the base vehicle.

Drilling fluid types in use to-day are classified into the following groups;

1. Fresh Water Muds.
2. Salt Water Muds.
3. Calcium Treated Muds.
4. Oil Emulsion Muds.
5. Sodium Silicate Mud.

Of all these mud systems the fresh water type is the basic, most universally used mud system. This is the natural result of the availability and normally satisfactory functioning of water as the fluid vehicle. The remaining mud systems have been developed to overcome drilling conditions which fresh water muds have difficulty in handling or for which they are totally unfitted. These substitute systems are specially compounded and usually are more costly to build and maintain than fresh water type.

II. Function and properties of drilling fluids.

The properties of the drilling fluid should be such as to promote safe and speedy drilling and completion of the well with the maximum productive capacity.

Cooling and lubricating the bit and drill pipe are absolutely necessary as considerable frictional resistance is encountered by the bit in drilling the formation and by the drill pipe in rotating against the side of the hole. If no fluid were present, the bit would soon be burned and dulled to a useless condition and the drill pipe would be severely abraded. The presence of liquid mud reduce the friction factor of the pipe and bit for the hole and dissipates any heat so generated.

Removing cuttings from the hole is also a basic and vital work of the drilling fluid. This removal process is linked both to the mud properties and to the mud velocity, the mud velocity depending upon the size and speed of operating pump. The pumps contribute but one property, velocity. The rate at which a cutting will settle in a quiescent mud column depends upon its size and shape, the difference in density between the cutting and the mud and the viscosity of the mud.

The wall-building properties of the drilling fluid are often of considerable importance. The thickness of the wall cake and the quantity of fluid lost to the formation may exercise considerable influence over the drilling of the well. If a thick cake is formed over the face of the producing formation it may not become properly cleaned off during the well.

(Drilling Engineering Handbook).

V. Read and remember the following words and expressions:

To abrade	- скалывать
Calcium treated mud	- глинистый раствор, обработанный кальцием
Cutting (chipping)	- шлам, выбуренная порода
Face	- поверхность
To dull	- затупляться, изнашиваться
Film	- пленка
Oil-base mud	- промывочный раствор на нефтяной основе
Salt water mud	- соленый глинистый раствор
Sodium silicate mud	- натриевый силикатный раствор
Water base mud	- глинистый раствор на водной основе
Caving in	- обрушение, обвал
To lubricate	- смазывать
annular space = annulus	- <i>затрубное пространство</i>
vehicle	- <i>зд.: растворитель, носитель</i>
mud weight	- <i>удельный вес бурового раствора</i>
circulating pump	- <i>буровой насос</i>
the only requisite to fall in this class	- <i>единственное требование для того, чтобы попасть в этот класс</i>

VI. Find Russian equivalents to the following phrases:

- | | |
|--------------------------------------|---|
| 1. classification of drilling fluids | 1. вязкость бурового раствора |
| 2. annular space | 2. сопротивление трению |
| 3. to flush out the chippings | 3. Удаление выбуренной породы из скважины |
| 4. to bring to the surface | 4. Выносить на поверхность |
| 5. to prevent from caving in | 5. затрубное пространство |
| 6. friction resistance | 6. предотвращать обвал стенок скважины |
| 7. viscosity of the mud | 7. удалять шлам |
| 8. removal of cuttings | 8. классификация буровых растворов |

VII. Translate the following sentences into Russian.

Pay attention to -ing forms.

1. The well needs cleaning.
2. A mud cake is formed on the walls of the hole to prevent them from caving.
3. The engineer insisted on completing the well.
4. Drilling fluid is used to prevent cuttings from setting in the hole and sticking the bit during periods of noncirculation.
5. Perforating is a process by means of which the fluid is allowed to enter the well-bore.
6. This method enjoys considerable popularity, since it allows selective intervals to be cored without removing the drill pipe.
7. Casing may be set through the producing formation, in this case holes are shut through the casing and column of hardened cement to permit the flow of oil and gas into the well bore.
8. The mud going into the drill pipe and mud coming out of the hole is to be weighed each 30 minutes while drilling.
9. A number of natural forces are active in driving oil and gas to producing wells.
10. Our engineers discussed a new method of increasing oil production.

VIII. Translate the following sentences into English. Use the active vocabulary of the lesson.

1. Буровой раствор это жидкость, которая циркулирует на забое скважины в процессе бурения.
2. Глинистый раствор закачивается в скважину насосами по бурильным трубам, захватывает частицы выбуренной породы, выносит их на поверхность и после очистки от породы снова закачивается в скважину.

3. Глинистый раствор препятствует возникновению газовых, нефтяных и водяных фонтанов, предупреждает обвалы стенок скважины и заклинивание (clogging) бурильных труб, охлаждает долото, способствует интенсификации бурения.

4. Буровой раствор используется для того, чтобы предотвратить обвал стенок скважины в обваливающихся породах.

5. Такой тип раствора безопасен для окружающей среды и для продуктивных слоев.

6. Такие растворы применяют при глубоком бурении с высокими температурами.

IX. Answer the following questions on the text:

1. What two systems are drilling muds based on?
2. Which of the two muds (water-base muds or oil-base muds) are more widely used?
3. Into what groups are drilling fluid types classified?
4. What are the basic properties of the drilling fluid?
5. Why should the bit and drill pipe be cooled and lubricated?
6. What will happen to the bit if no fluid is present in the well?
7. Does the presence of liquid mud reduce the friction factor of the pipe and bit?
8. Is it necessary to remove cuttings from the well?
9. How are cuttings removed from the well?
10. What does the rate of the cutting settling depend upon?
11. When does the history of drilling fluids begin?