**Тема: Происхождение нефти и газа**

*oil (petroleum)* нефть (природная смесь жидких углеводородов и органических соединений кислорода, серы и азота)

*oil accumulation* залежь/скопление нефти; формирование залежи нефти

*organic theory of oil origin* теория органического происхождения нефти

*inorganic theory of oil origin* теория неорганического происхождения нефти

*fossil fuel* ископаемое топливо

*hydrogen* водород

*carbon* углерод

*to presume* предполагать, полагать; допускать; считать доказанным

*scientist* ученый

*hydrocarbon* углеводород

*reservoir* пласт-коллектор; пластовый резервуар (нефти, газа); нефтеносный слой; газоносный пласт; продуктивный пласт; залежи, месторождение (нефти, газа)

*marine* морской (принадлежащий, относящийся к морю, морскому миру)

*terrestrial* сухопутный; наземный

*pressure* давление

*temperature* температура

*porous rocks* пористая порода

*to collect* скопляться, собираться, собирать

*natural trap* естественная ловушка

*underground formation* подземный пласт, подземное образование

*Earth* земля

*force of gravity* сила тяжести, земное притяжение

*impermeable* непроницаемый, герметический;

*seep* выход, высачивание (нефти, газа) // просачиваться

*flowing water* проточная вода

*volatile* летучий; легкоиспаряющийся

1. Закончите предложение, выбрав правильный вариант ответа.

1. We usually imagine \_\_\_\_\_\_\_\_\_ as black, thick liquid.

*carbon, the Earth, oil*

2. The \_\_\_\_\_\_ theory presumes that hydrogen and carbon that make up petroleum came from plants and animals living on land and in sea.

*organic, inorganic, flowing*

3. Liquids like gasoline tend to evaporate. In such cases we say these liquids are \_\_\_\_\_.

*porous, impermeable, volatile*

4. Most of the time oil is underground but sometimes it \_\_\_\_\_\_ to the surface. *presumes, collects, seeps*

5. Most of the world’s petroleum had been found trapped in \_\_\_\_\_\_\_\_.

 *scientists, porous rocks, flowing water*

6. Elephant, cat and cow are \_\_\_\_\_ animals. Dolphins, whales and seals are \_\_\_ animals.

*pressure, Earth, terrestrial water, marine, volatile*

2. Переведите следующие предложения с английского языка на русский:

1. It is not possible to determine the exact origin of oil and gas because it is impossible to identify the exact place or materials from which any particular oil accumulation originated.

2. Hydrogen and carbon that make up petroleum came from plants and animals living on land and in sea.

3. Heat and pressure transformed the organic materials into solid, liquid or gaseous hydrocarbons.

4. Oil is derived from marine plants and animals.

5. Natural gas is formed from almost any marine or terrestrial organic materials.

6. Most of the world’s petroleum was found trapped in porous rocks.

7. Hydrocarbons can escape into atmosphere. Flowing water washes away the hydrocarbons.

**Origin of Oil and Gas**

Nowadays there are two main theories explaining the origin of petroleum or oil and natural gas - organic and inorganic ones. However, it has not been possible to determine the exact origin because it has not been possible to identify the exact place or materials from which any particular oil accumulation originated. The precise details regarding the problems of origin, migration and accumulation of petroleum have yet to be fully answered. Recent advances in analytical chemistry and geochemistry have advanced the knowledge and understanding, but issues remain to be resolved. The oil pool (field) is an end product to a 5-stage sequence of events: raw materials, accumulation, transformation, migration and geologic time. But the complication is that petroleums are complex mixtures of many hydrocarbons occurring in series with no two petroleums exactly alike in composition. This is probably due to variations in primary source materials and subsequent processes during formation such as pressure and temperature changes. Although the components of petroleum unite to form complex mixtures, the typical elemental chemical analysis indicates 10-15% hydrogen and 82-87% carbon weight.

• heavy crude

• light crude

• methane gas

• propane gas

• butane gas

• cyclo-hexane gas.

The organic theory presumes that hydrogen and carbon that make up petroleum came from plants and animals living on land and in sea. This explanation is most generally accepted by scientists. Heat and pressure transformed the organic materials into solid, liquid or gaseous hydrocarbons known as fossil fuels - coal, crude oil or natural gas. Oil is typically derived from marine plants and animals. Natural gas can be formed from almost any marine or terrestrial organic materials, under a wide variety of temperatures and pressures. The inorganic theory holds that hydrocarbons were trapped inside the Earth during the planet’s formation and are slowly moving upwards. According to this theory, the hydrogen and carbon were brought together under great pressure and temperature deep in the Earth to form oil and gas, which then found its way through porous rocks to collect in natural traps in the underground formations of the earth.

Due to the force of gravity and the pressure created by the overlaying rock layers, oil and natural gas seldom stay in the source rock in which they are formed. Instead, they move through the underground layers of sedimentary rocks until they either escape at the surface or are trapped by a barrier of less permeable rock. Most of the world’s petroleum had been found trapped in porous rocks under relatively impermeable formations. These reservoirs are often long distances away from the original source. A seep occurs when hydrocarbons migrate to the Earth’s surface. Over time, huge amount of these hydrocarbons have escaped into atmosphere. Flowing water can also wash away hydrocarbons. Sometimes only lighter, more volatile compounds are removed, leaving behind reservoirs of heavier types of crude oil.

2. Переведите следующие предложения с русского языка на английский:

1. Теплота и давление преобразуют органические материалы в твердые, жидкие или

газообразные углеводороды.

2. Благодаря силе притяжения и давлению, создаваемым горными породами, нефть и

природный газ редко остаются в породе, где они образовались.

3. Нефть и газ движутся в сторону подземных осадочных пород, откуда они могут подняться

поверхность.

4. Залежи нефти и газа часто находятся далеко от источника своего формирования.

5. Большое количество углеводородов попадает в атмосферу.

3. Ответьте на следующие вопросы:

1. What theories about oil and gas origin do you know?

2. What is your personal opinion on these theories?

3. What theory is supported by most of scientists?

4. What transforms the organic materials into solid, liquid and gaseous hydrocarbons?

5. How can oil be formed?

6. What forms the gas?

7. Why oil and gas seldom stay in the source rock where they are formed?

8. Where oil and gas can be trapped?