**Degree of Uncertainty for Oil Reserves**

The uncertainty is dependent on the followings:

* Economic progress of the world
* Changes in climate
* Depletion policies in the leading producing locations
* Regulations
* Other factors such as infrastructure and transportation

In 2010, Venezuela surpassed Saudi Arabia with its proven oil reserves which increased from 99 billion barrel (bb) to 292 bb. Venezuela has an R/P ratio more than 250 years.

R/P ratio is a significant parameter which signifies reserves-to-production ratio and thus, the corresponding reserves has a high degree of certainty.



Above figure is taken from the below source:

https://www.iea.org/publications/freepublications/publication/Resources2013.pdf

**Fuels Classification**

**Formation of fossil fuels**

Once the living matter dies, it sinks to the bottom portions of the swamps, seas and lakes. After a certain time, these turned into spongy material. After being covered with sand and minerals, spongy material is converted into rocks. Under the combined influence of temperature and pressure and as well as catalytic effects for a prolonged time, rocky materials are converted coal, oil and natural gas.

**Hydrocarbon Fuels (HCs)**

Aliphatic alkanes are represented by CnH2n+2.

Cycloalkanes have ring structure and have single bonds between atoms.

Alkenes have at least one double C=C bond.

Alkynes have at least one triple CC bond.

Aromatic HCs have single and double C-C in their structure. They possess a pleasant smell such as phenol (below).



*Phenol*

HCs are also referred to as follows:

Aliphatic alkanes are called paraffins.

Alkenes are called olefins.

Cycloalkanes are called naphthenes (below).



*Cycloalkanes*

**Boiling Points of some certain HCs**

|  |  |
| --- | --- |
| **Hydrocarbon** | **Boiling Point (K)** |
| Methane | 111.5 |
| Ethane | 184.4 |
| Propane | 231 |
| n-Butane | 272.5 |
| n-Pentane | 309 |
| n-Hexane | 341.7 |
| n-Heptane | 371.4 |
| n-Octane | 398.7 |
| n-Decane | 447.1 |

As seen above, as the size of the molecules increase, their boiling points increase indicating that they become less volatile.

Reference: Ghazi A. Karim, Fuels, Energy and the Environment, 1st Edition, CRCPress.