

## 10 Glossary

**$\beta$ -factor** - equivalent to the stretching factor defined by McKenzie (1978) in its rift model. During rifting, the crustal layers will be stretched by a factor of  $\beta$  and thinned by a factor of  $(1 - 1/\beta)$ .

**HC** - Hydrocarbon.

**HC mass per mass of Rock** - Mass of liquid Hc per unit mass in a cell. For source-rock having generated hydrocarbon, this parameter represents the remaining liquid HC not expelled from the source-rock (equivalent to RockEval S1). Units: kg/T, ... Availability: Needs at least two phase flow. Typical values: Assuming 10% porosity and 10% saturation gives ca. 4 kg/T for source rock having generated hydrocarbon

**Hydrogen Index (HI)** - The hydrogen Index represents sum of partial potential of each kinetic reaction. It is given in mg HC / g Org. Carbon.

**Kerogen** - The kerogen is the part of the organic matter contained in the sediment that produces hydrocarbon molecules when heated over a period of time. This process is called maturation. It is a chemical process governed by heat and time which can be described by a collection of first order parallel partial reactions. If the maturation is performed to its term, each partial reaction will be responsible for the transformation of a part of the kerogen called the partial potential. The sum of all the partial potentials is referred to as the Hydrogen Index (HI).

This description of the kerogen maturation is sufficient to simulate the progressive transformation of a kerogen buried in a sedimentary basin. But it is not sufficient to describe the nature of generated chemical products. These products are mostly hydrocarbon molecules. Their number and complexity is such that they cannot be simulated individually. For the sake of simplicity (and practicality), the hydrocarbon molecules are grouped into classes according to their physical behavior. The terms component, HC component or HC fraction are all valid synonyms for these classes of HC molecules.

To simulate the generation of hydrocarbons Temis2D<sup>TM</sup> computes the effect of the temperature on kerogen. It calculates the part of organic matter that is transformed into hydrocarbons when temperature increases. The kerogen is related to the type of organic matter contained in the source rock. The kerogen features a hydrogen richness and a kinetic scheme describing transformation into hydrocarbon.

**Liquid Saturation (Liq. Sat)** - Ratio of Volume of liquid HC to the Porous volume.

**Petroleum Potential (S2)** - The petroleum potential is the hydrocarbon yield of the immature source rock. It corresponds to the Rock Eval S2 peak. It is expressed in mg/g or Kg/t rock.

**S2 (Petroleum Potential)** - is deduced from the Hydrogen Index (HI) and the Total Organic Content (TOC) by the following relationship:

$$S2 = \text{TOC} * \text{HI} / 100$$

**T<sub>max</sub>** - Theoretical maximum temperature of a simulated RockEval pyrolysis, using the set of kinetic parameters of the kerogen attached to the cell lithology. Since T<sub>max</sub> measurements are usually scattered in a given source-rock quality of measurements, comparison with actual measurement is considered as valid within a +/- 10°C range. A T<sub>max</sub> variation is detectable if the Kerogen kinetics display a spectrum of variable activation energies (e.g. Type III).

**Total generated HC** - Total amount of HC generated from the kerogen contained in a cell.

**Total Organic Content (TOC)** - It represents the source rock richness, i.e. the quantity of organic carbon contained in the source rocks. It is given in weight % mass of rock.

**Transformation Ratio (TR)** - Ratio of generated petroleum to potential petroleum. TR is calculated only in the kerogen bearing cells (source-rock cells). TR is calculated from the kinetic reaction of petroleum formation. It is not dependent on the source-rock potential, and can be used to evaluate the level of maturity of the source-rock (see kg/t).