

PETROL HAKKINDA GENEL BİLGİLER

1- Fiziksel Özellikler

1.1. Yoğunluk

$$\text{API derecesi} = \frac{141.5}{60^{\circ}\text{F deki Öz.A.}} - 131.5$$

$$\text{Baumé derecesi} = \frac{140}{60^{\circ}\text{F deki Öz.A.}} - 130$$

Bu üç ölçü birimlerine ait bazı değerler Tablo 2.3 de görülmektedir.

Tablo 2.3 Özgül Ağırlık, API, ve Baumé Değerleri Arasındaki Bazı Eşdeğerlikler

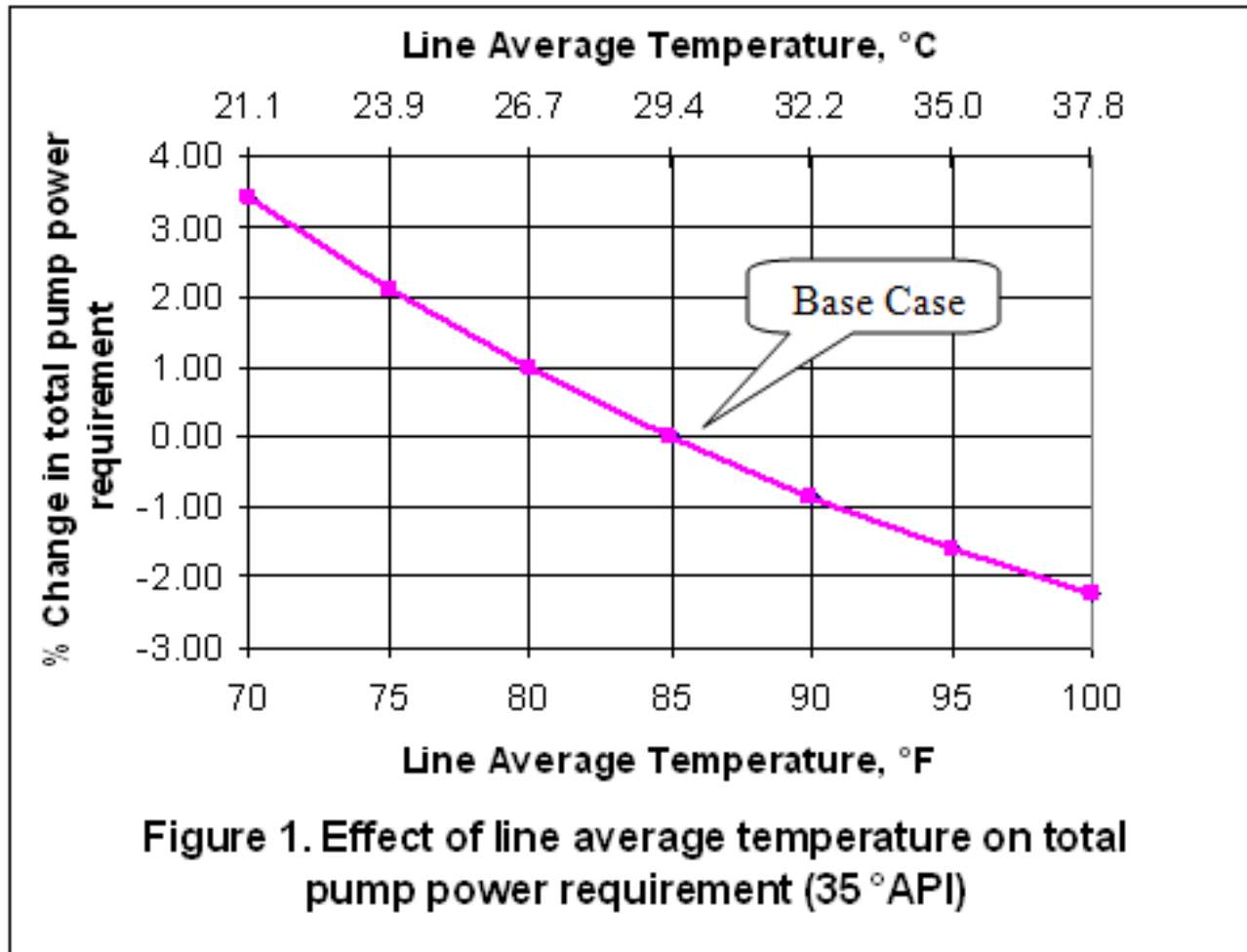
Özgül Ağırlık (d)	API	Baumé
1.0000	10.0	10.0
0.9333	20.1	20.0
0.8750	30.2	30.0
0.8235	40.3	40.0
0.7778	50.4	50.0



1.2. Viskozite (ağdalılık) (poize, santipoize)

Hava: 1.8×10^{-8} poiz

Su: 1 poiz



1.3. Hacim

Petrol hacmi geleneksel olarak varil ile ölçülür. 1 varil 42 galon=159 lt'dir

1.4. Kırılma indisi

1,39-1,49 arasında değişir.

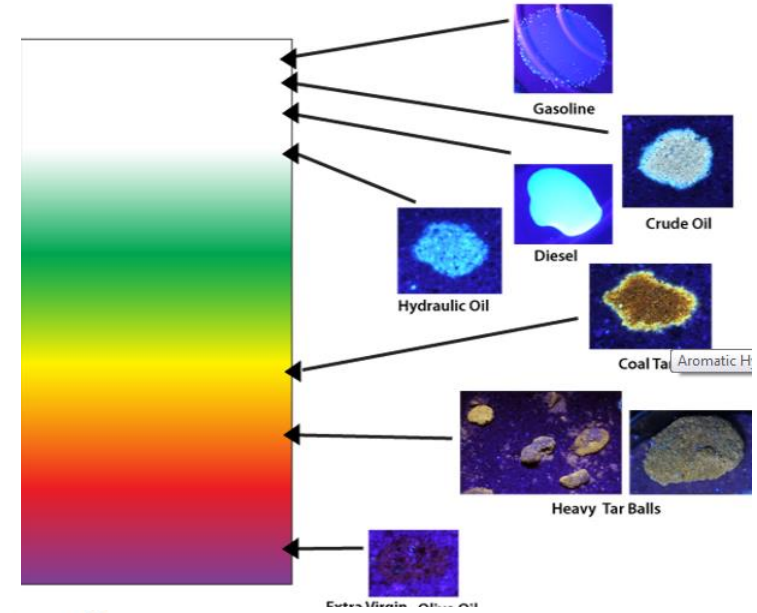
yoğunlukla doğrusal ilişkilidir.

kuyu başında petrol kalitesini hızlı belirlemede kullanılır.

1.5. Florösan özelliği

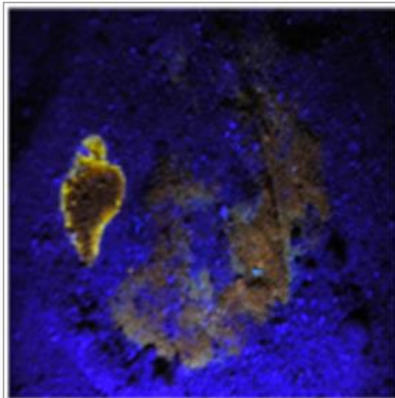
ultraviyole ışıkta farklı renkler gösterir. Kuyu başında sondaj kırıntılarında eser miktarda petrol olsa da saptanabilir.

Hydrocarbon Contaminant Color Chart

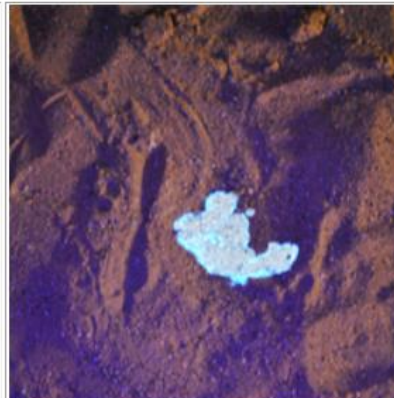


UV Oil (Aromatic Hydrocarbon) Detection

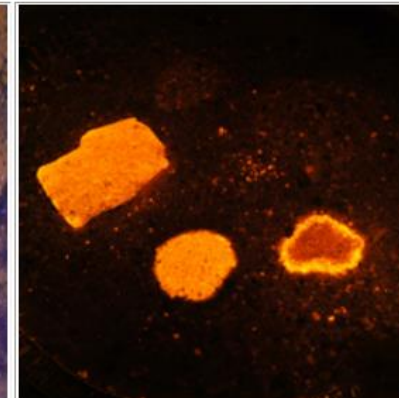
Crude oil detection with Vertek's LVUV ultraviolet (UV) LED technologies is the cleanest and most efficient method of monitoring the oil spill progress by discriminating the crude oil and other aromatic hydrocarbons from sand, mud, sea life, and saltwater.



Tarballs glowing under our hand held UV light



Crude oil glows by our Oil Fluorescing Spot Light



Tarballs fluorescing under UV exposure with our new filtering techniques

1.6. Renk ve Koku

- ✓ Genellikle yeşilimsi.
- ✓ Koku, naften ve parafince zengin olanlarda hoş; S ve N'ce zengin doymamış hidrokarbonlarda çok kötü

Crude Oil Collection



Crude Oil Collection - Whanganui Rock and Lapidary Club



1.7. Kalorifik Değer

Yoğunlukla ters orantılı değişir.

$d=0,9 \rightarrow 17 \text{ API} \rightarrow 10,500 \text{ cal/gr}$

$d=0,7 \rightarrow 70 \text{ API} \rightarrow 11,700 \text{ cal/gr}$

RAFİNERİ İŞLEMLERİNİN ÜRÜNLERİ

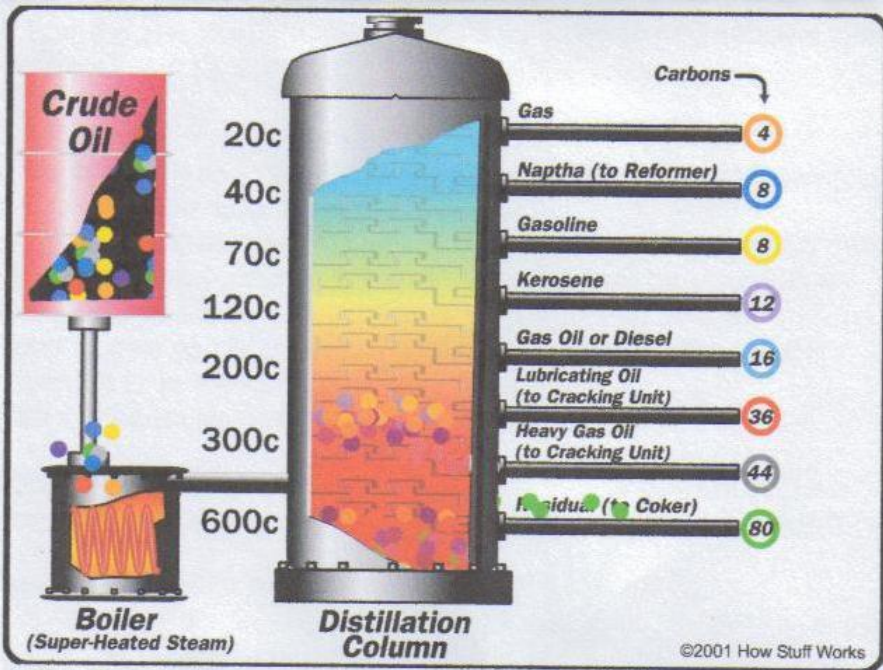
Ürünün C atomu sayısı:

1-4 → gaz

5-16 → sıvı

17-22 → yarı katı

>22 → katı

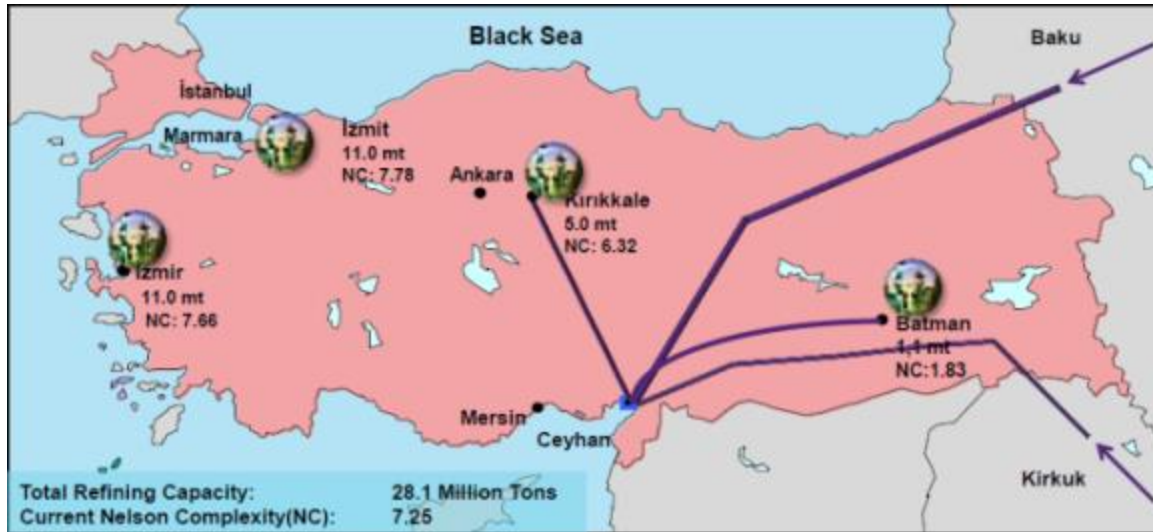


The oil refining process starts with a fractional distillation column.

Tablo 2.1 Petrol Ürünleri, Özgül Ağırlıkları ve Kalori Değerleri

	ÖZGÜL AĞIRLIĞI	KALORİ DEĞERLERİ
LPG	0.55 gr/cm ³	12.000 cal/kg.
Nafta	0.71 gr/cm ³	11.500 cal/kg.
Benzin	0.73 gr/cm ³	11.500 cal/kg.
Gazyağı	0.79 gr/cm ³	11.000 cal/kg.
Motorin	0.93 gr/cm ³	11.000 cal/kg.
Fuel-Oil	0.94 gr/cm ³	10.000 cal/kg.
Solvent	0.77 gr/cm ³	11.500 cal/kg.
Asfalt	0.83 gr/cm ³	10.000 cal/kg.
Makina Yağları	0.88 gr/cm ³	10.000 cal/kg.
Parafin	0.85 gr/cm ³	10.000 cal/kg.

Türkiye'deki Rafineriler



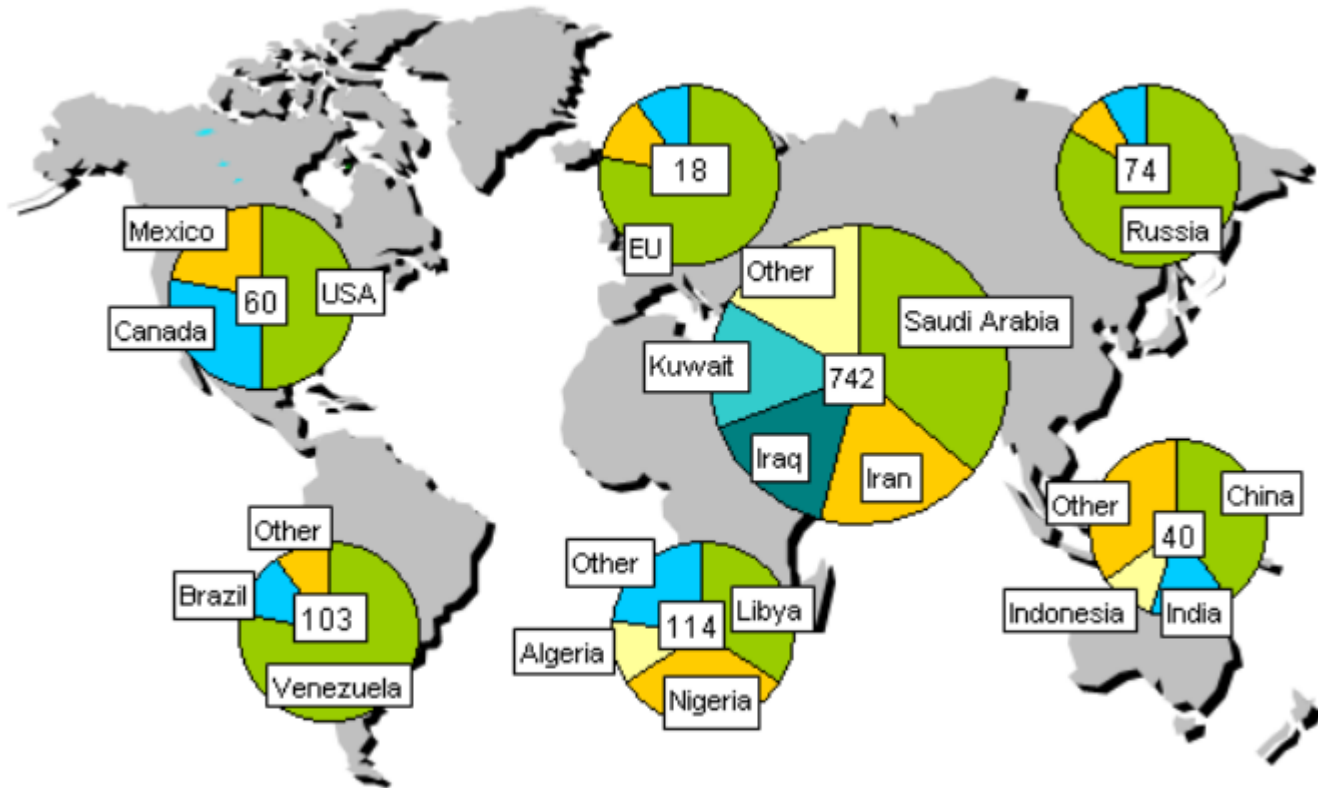
PETROLÜN COĞRAFİK DAĞILIMI

Basra Körfezi → %58

Meksika Körfezi → %30

Diğer Provensler (Bakü, Endonezya, Kuzey Denizi, Kanada vs.) →

Figure 2. Distribution of the approximately 1,200B bbls total world oil proved reserves.

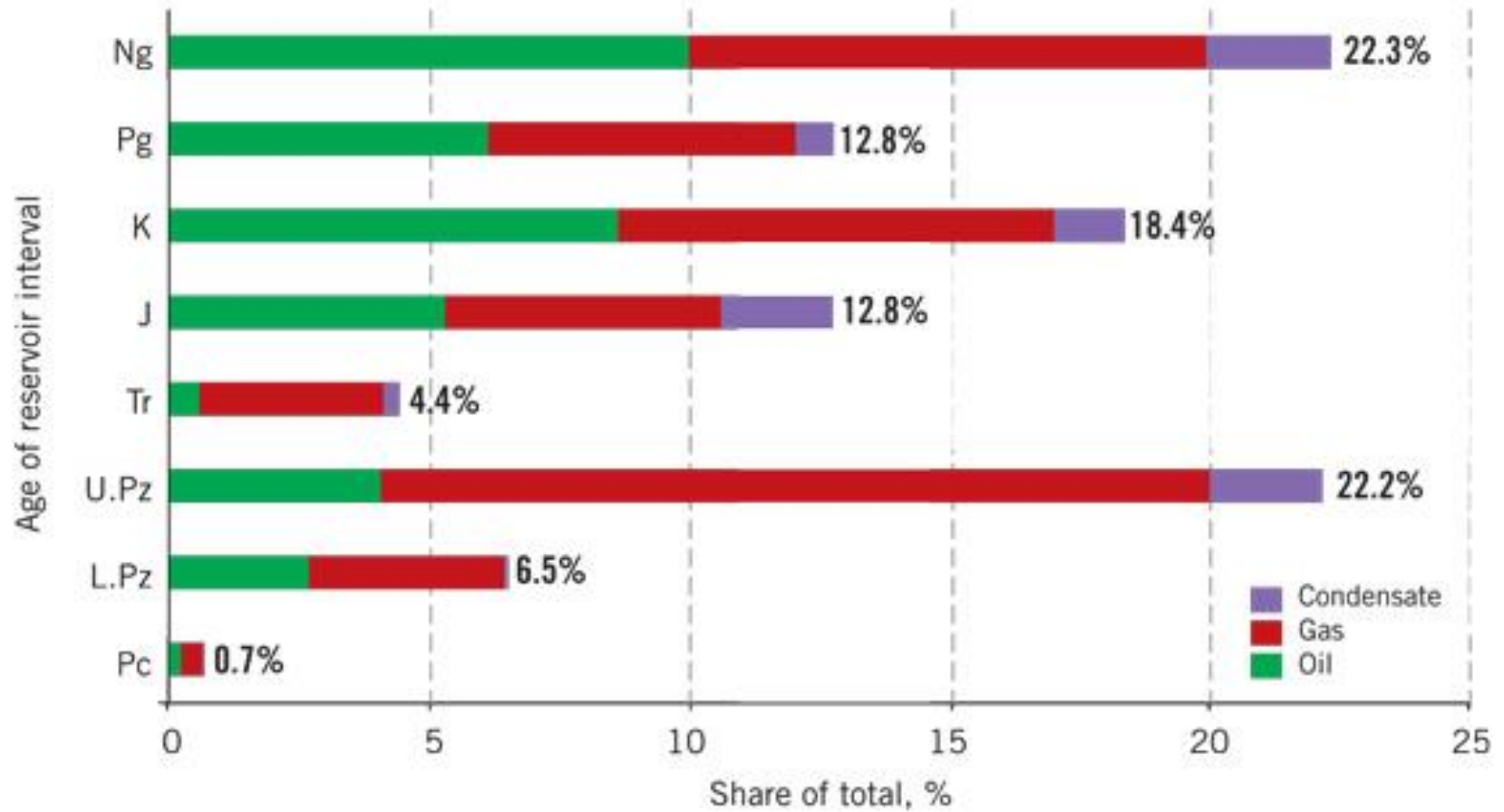


Note. The pie charts for each major location show the estimated proved reserve volume in billion bbls, and the proportion for the main countries is shown in the pie segments. Source: BP (2006).

PETROLÜN ZAMANSAL DAĞILIMI

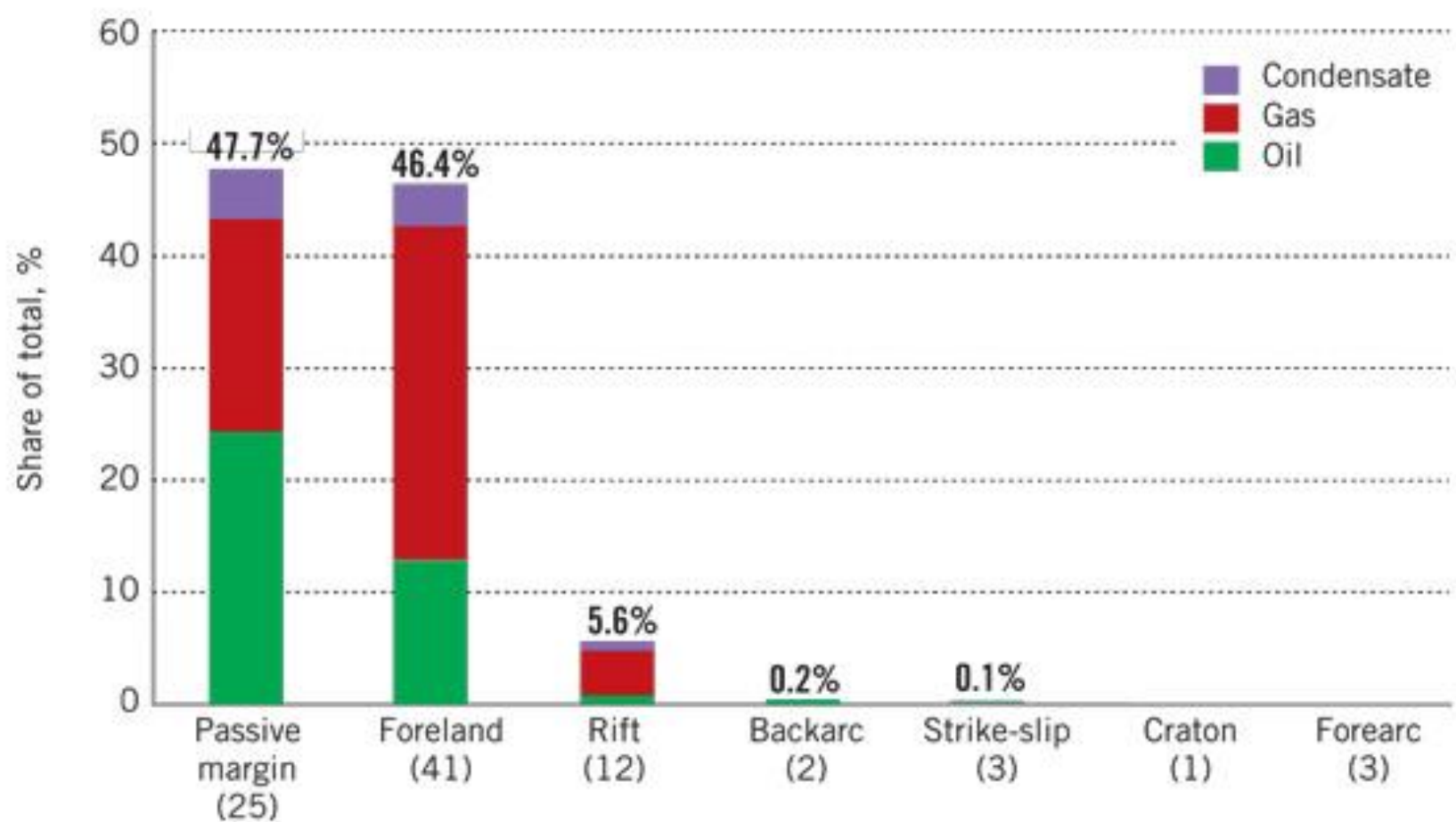
STRATIGRAPHIC DISTRIBUTION OF DEEP PETROLEUM

FIG. 5



RELATIVE ABUNDANCE OF PETROLEUM BY BASIN TYPE

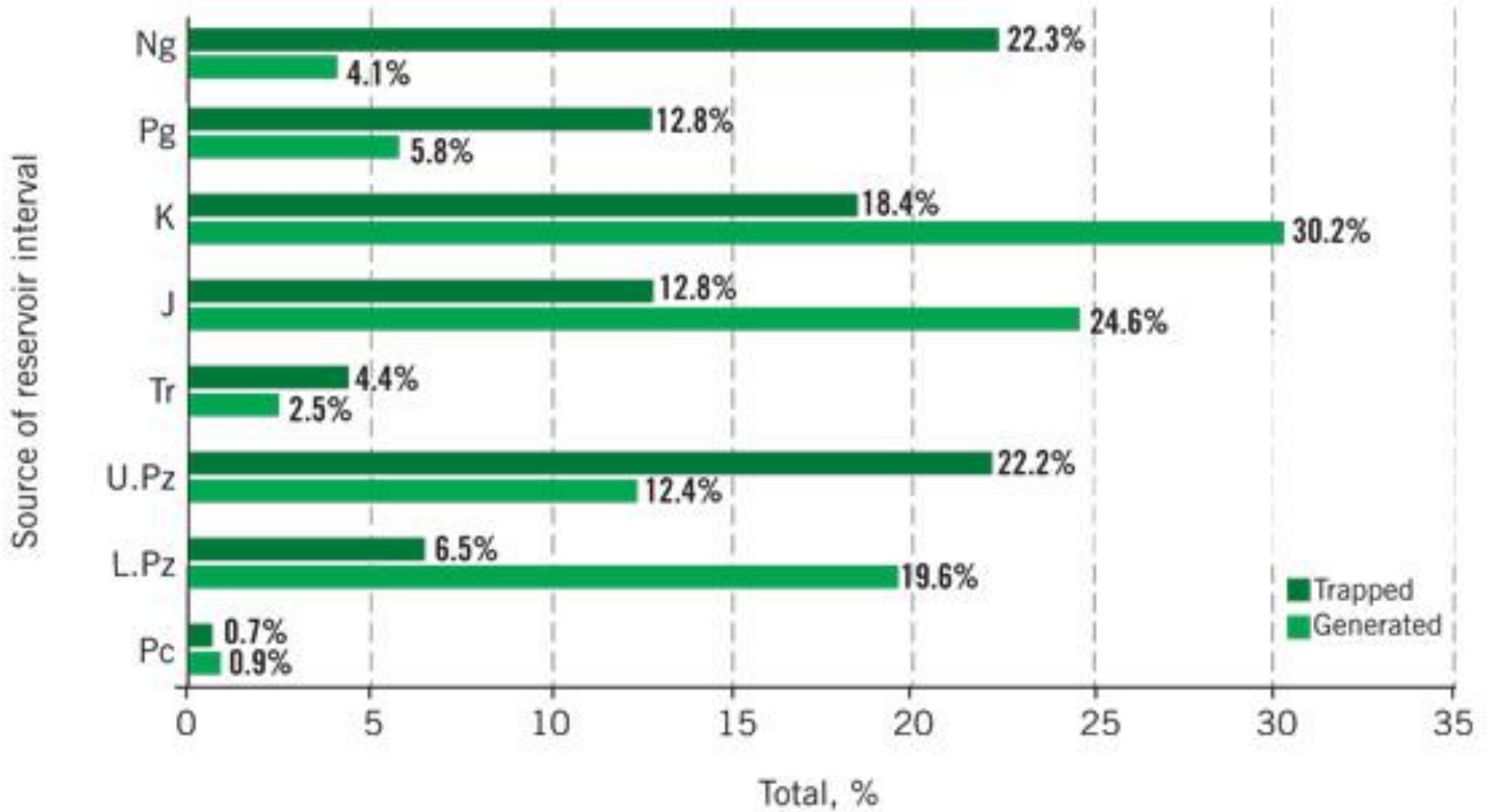
FIG. 3



Üretilmiş ve Kapanlanmış Derin Petrol Rezervleri

GENERATED VERSUS TRAPPED DEEP PETROLEUM RESERVES

FIG. 6



Kömürün Kimyasal Özellikleri

C'nin H ile yaptıkları bileşiklere Hidrokarbonlar denir.

parafin serisi → C_nH_{2n+2} (doymuş hidrokarbonlar)

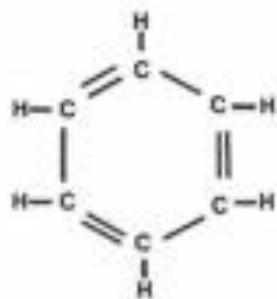
olefin serisi → C_nH_{2n}

asetilen serisi → C_nH_{2n-2}

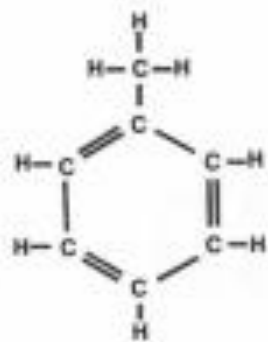
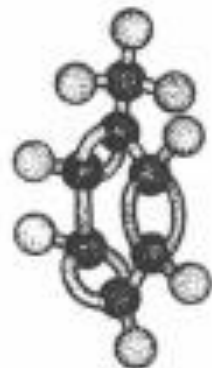
aromatlar serisi → C_nH_{2n-6}

Tablo 2.4 Parafin (veya Metan) Serisi ve Bazı Fiziksel Özellikler.

Formül	İsim	Donma N. °C	Kaynama N. °C	Yoğunluk g/cm ³
CH ₄	Metan	— 184	— 161	_____
C ₂ H ₆	Etan	— 172	— 88	_____
C ₃ H ₈	Propan	— 190	— 45	_____
C ₄ H ₁₀	Bütan	— 135	— 1	_____
C ₅ H ₁₂	Pentan	— 132	36	0.631
C ₆ H ₁₄	Hekzan	— 94	69	0.660
C ₇ H ₁₆	Heptan	— 90	98	0.684
C ₈ H ₁₈	Oktan	— 57	125	0.707
C ₉ H ₂₀	Nonan	— 51	151	0.718
C ₁₀ H ₂₂	Dekan	— 32	174	0.747
C ₁₁ H ₂₄	Undekan	— 27	197	0.741
C ₁₆ H ₃₄	Hekzadekan	20	288	0.775



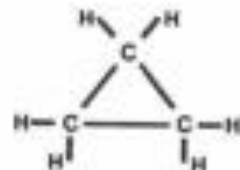
BENZENE C_6H_6



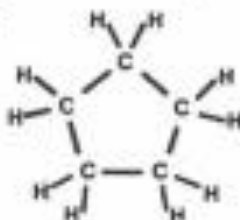
TOLUENE C_7H_8



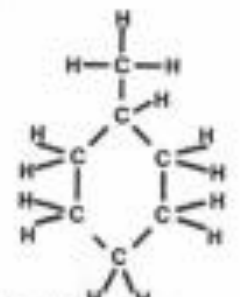
CYCLOPROPANE



CYCLOPENTANE



METHYLCYCLOHEXANE



C_nH_{2n}

C_nH_{2n+2}



HCH Methane



HCH Ethane



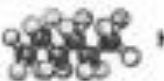
HHH Propane



$HHHH$ Butane



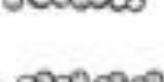
$H-C-C-C-C-H$ Pentane



$H-C-C-C-C-C-H$ Hexane



$H-C-C-C-C-C-C-H$ Heptane



$H-C-C-C-C-C-C-C-C-C-C-H$

Decane

Şekil 2.1 Bazı hidrokarbonların kimyasal yapıları ve bileşimleri (Beckmann, 1976)

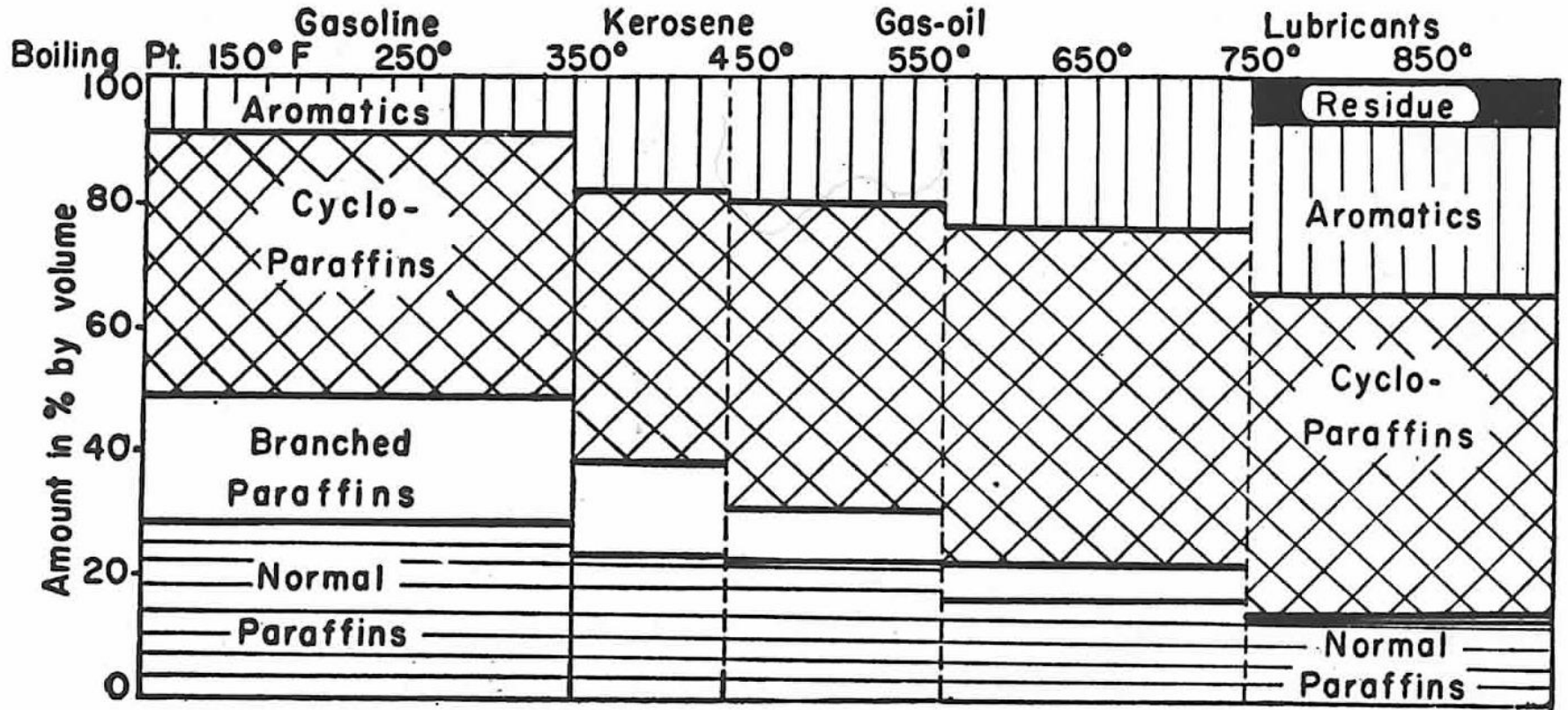


FIGURE 8-22 Diagram showing the percentage composition by volume of the chief products obtained from United States crude oils. [Redrawn from Shaffer and Rossini, Proc. Amer. Petrol. Inst., Vol. 32 (1952), p. 64.]

Şekil 2.2 Ham petrolden elde edilen bazı destile ürünlerin hidrokarbon gruplarına göre hacimce yüzde bileşimleri (Levorsen, 1958'den)

Tablo 2.5 Ham Petrolün Elementlere Göre Ortalama Bileşimi

Element	Alt Sınır %	Üst Sınır %
C	82.2	87.1
H	11.7	14.7
S	0.1	5.5
N	0.1	1.5
O	0.1	4.5
(Organik Madde)	0.1	1.2

Tablo 2.6 Doğal Gazın Moleküllerine Göre Ortalama Kimyasal Bileşimi

Molekül	% Hacim
Metan (CH ₄)	80
Etan (C ₂ H ₆)	7
Propan (C ₃ H ₈)	6
Bütan (C ₄ H ₁₀)	2.5
İzobütan (C ₄ H ₁₀)	1.5
(C ₅ H ₁₂)	3
TOPLAM	100.0