Figure 5.8

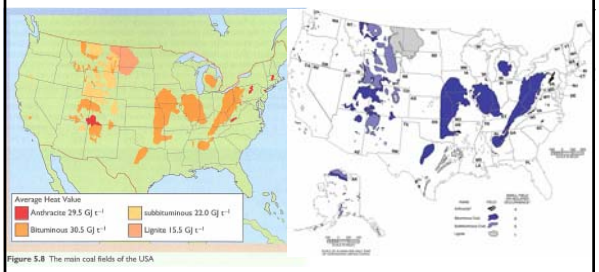


Figure 5.8 The main coal fields of the USA

Hypothetical Coal Molecule

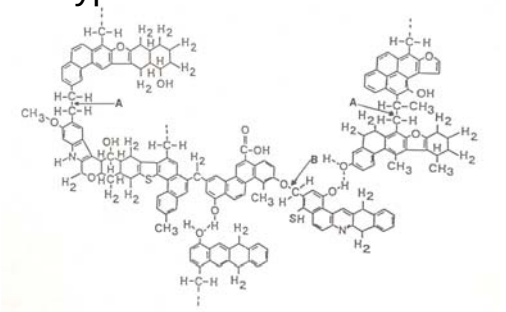


Figure 1. Summary of coal structure information in a hypothetical coal molecule.

From Solomon and coworkers (1985)

Reacting Coal Molecule

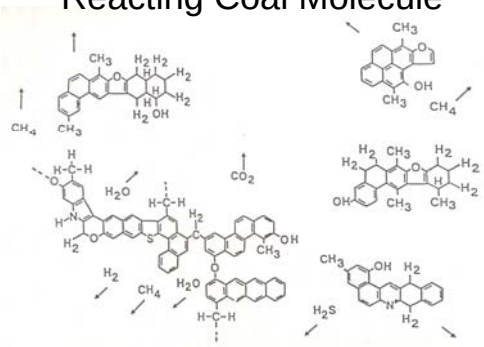
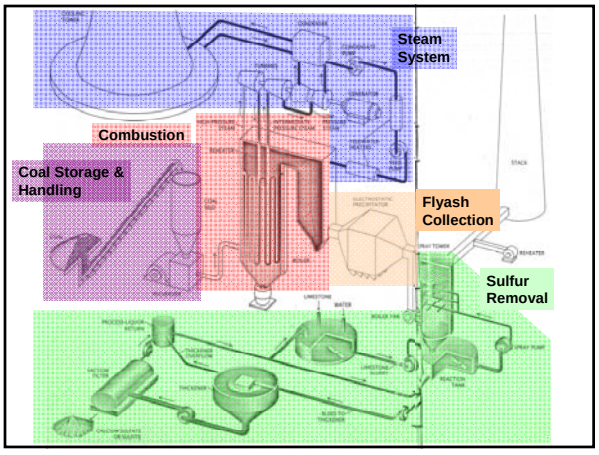


Figure 2. Cracking of hypothetical coal molecule during thermal decomposition.

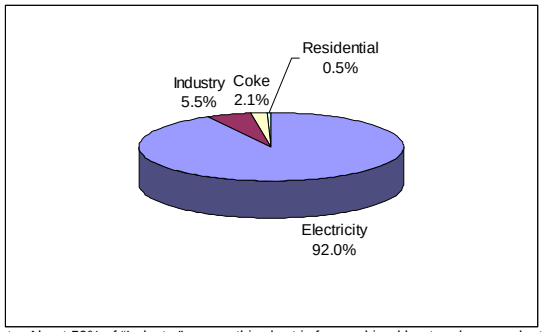
TABLE I *Classification of Coals by Rank*

Class	Group	Fixed carbon limits (%) (dry, mineral-matter-free basis) ≥	Fixed carbon limits (%) (dry, mineral-matter-free basis) <	Volatile matter limits (%) (dry, mineral-matter-free basis) >	Volatile matter limits (%) (dry, mineral-matter-free basis) ≥	Calorific value limits (Btu/lb) (moist mineral-matter-free basis) ≥	Calorific value limits (Btu/lb) (moist mineral-matter-free basis) <	Agglomerating character
I.	Anthracitic							
	1. Meta-anthracite	98	—	—	2	—	—	nonagglomerating
	2. Anthracite	92	98	2	8	—	—	
	3. Semianthracite	86	92	8	14	—	—	
II.	Bituminous							
	1. Low volatile bituminous coal	78	86	14	22	—	—	commonly agglomerating
	2. Medium volatile bituminous coal	69	78	22	31	—	—	
	3. High volatile A bituminous coal	—	69	31	—	14,000	—	
	4. High volatile B bituminous coal	—	—	—	—	13,000	14,000	
	5. High volatile C bituminous coal	—	—	—	—	11,500	13,000	agglomerating
						10,500	11,500	
III.	Subbituminous							
	1. Subbituminous A coal	—	—	—	—	10,500	11,500	nonagglomerating
	2. Subbituminous B coal	—	—	—	—	9,500	10,500	
	3. Subbituminous C coal	—	—	—	—	8,300	9,500	
IV.	Lignitic							
	1. Lignite A	—	—	—	—	6,300	8,300	
	2. Lignite B	—	—	—	—	—	6,300	



US Coal Use (2005)

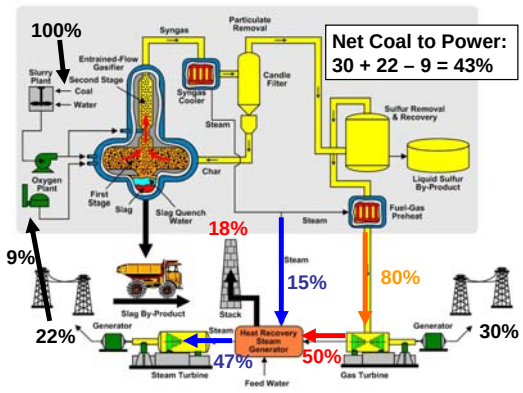
(from IEA pages)



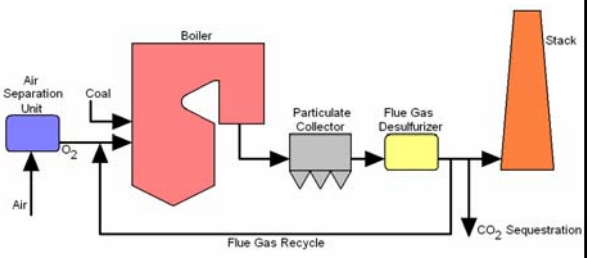
Note: About 50% of "Industry" use on this chart is for combined heat and power plants

Advanced Systems

Integrated Gasification Combined Cycle

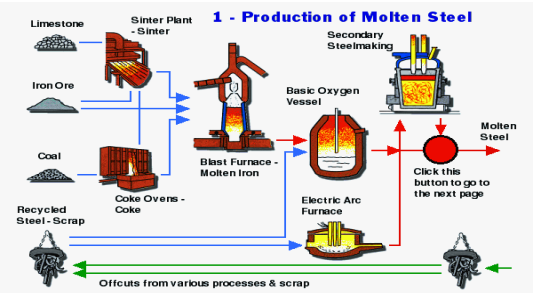


What is Oxy-fuel Combustion?



Other Uses for Coal

Steelmaking



Additional Processes

- Coal → gasifier → CO & H_2 → liquid fuels
- Coal → gasifier → CO & H_2 → chemicals