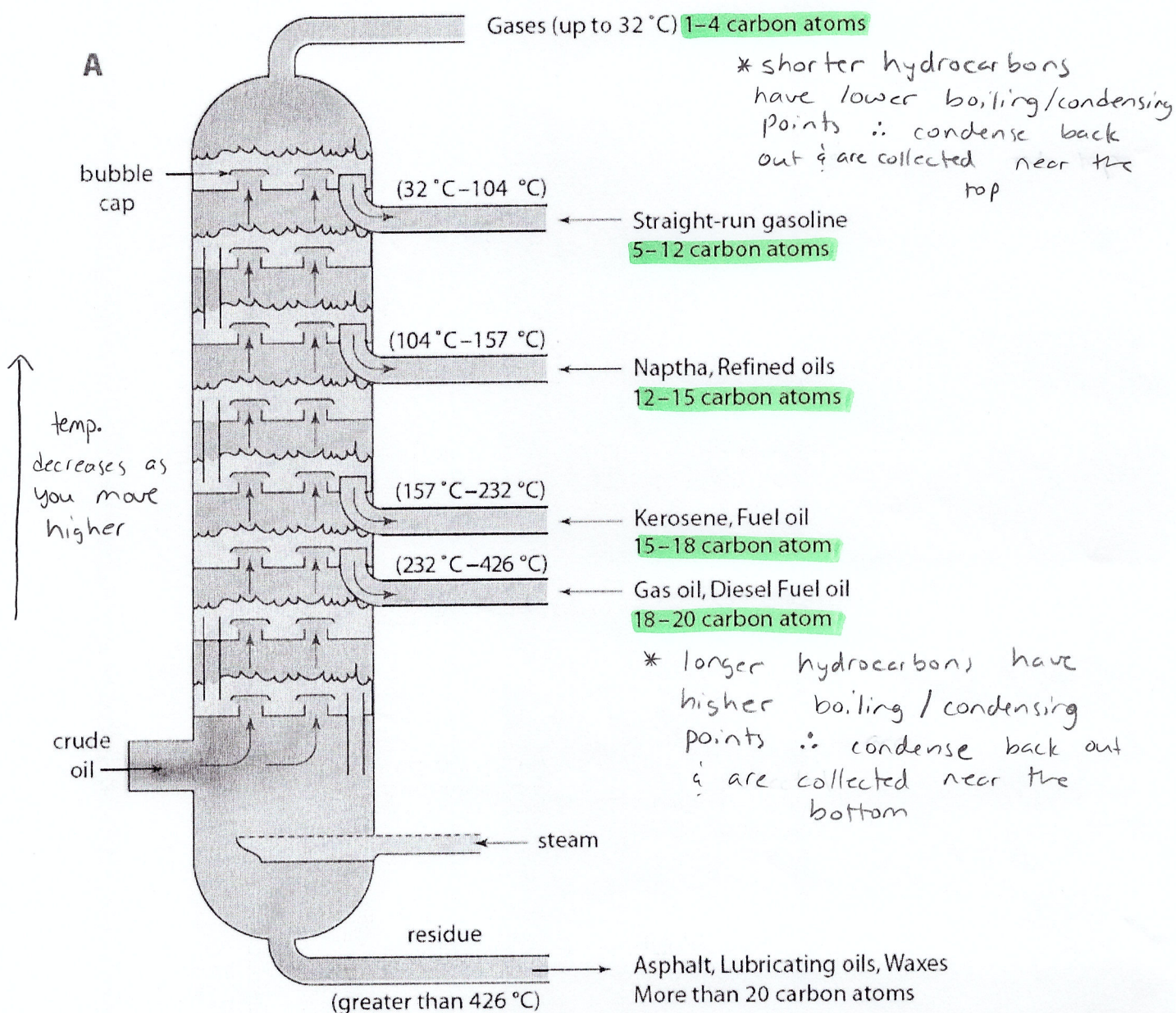


Refining Processes

- In Alberta, organic molecules are the building blocks of our petroleum industry (ie. oil and gas industry)
- Petroleum is the raw material pulled from the ground that contains a mixture of many different hydrocarbons.
 - Petroleum needs to be refined to isolated different hydrocarbons for different uses
- * • **Fractional distillation** is a process that uses both heating to evaporate hydrocarbons and cooling to condense hydrocarbons into their pure form
 - Fractional distillation is able to purify and isolate hydrocarbons because different hydrocarbons have different boiling/condensing points



- Once hydrocarbons are removed from a distillation tower, they may be chemically processed or purified further to make them marketable
- * • **Cracking** is a process of breaking a carbon-carbon bond in a hydrocarbon by heating the hydrocarbon under pressure in the absence of air
 - There are various types of cracking processes (steam cracking, hydrocracking, catalytic cracking), but they all essentially take a longer hydrocarbon chain and break it into a smaller hydrocarbon chain
- * • **Reforming** uses heat, very high pressure and catalysts to convert straight chain alkanes into branched-alkanes, cyclic alkanes, and aromatics
 - Reforming essentially is a process of *creating* a carbon-carbon bond
- * • **Solvent extraction** involves mixing an *insoluble solvent* with a hydrocarbon. The solvent dissolves any of the impurities in the hydrocarbon, leaving behind a purified hydrocarbon product. The insoluble solvent (with the impurities dissolved in it) can be drained off and discarded.