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Published on Aug 28, 2015

There are many different type of thermal conversion products. Thermal conversions can be used to produce solid, liquid, and gaseous products and a wide variety of each type depending on reaction conditions. Unfortunately it can also be a very confusing field because a lot of the same products have different names that would lead you to believe they are not even related. As you learn more about thermal conversions you will better understand what they are.

When we think about thermal conversions it is important to think about heat and oxygen. This is because heat and oxygen almost completely control what kind of thermal conversion will occur. As you add more oxygen and more heat to the process you get different types of thermal conversion. Addition of heat & oxygen will cause the biomass to leave pyrolysis and go to gasification and then with more heat & oxygen, move onto combustion. However, each thermal process also releases heat as well, so in pyrolysis a small amount of heat is generated, then in gasification more heat is generated, and then in combustion the most heat is generated.

The type of thermal conversion is defined by the desired product. If you want heat, you want to use combustion. If you want gas you probably want gasification. If you want liquids and solids, pyrolysis is most ideal. None of the conversions is really good at making things other than its primary product, so it makes the most sense to figure out what the desirable product is and then find the appropriate process. It is also almost impossible to separate biomass pyrolysis, gasification, and combustion entirely. All thermal conversions are optimized for a type of thermal conversion based on a desired product, but that only means that of the various products, the primary product is produced the most – it never means it is the only product.

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