WHAT IS CLAIMED IS:

1. A method of processing biomass to a product, the method comprising:

irradiating with accelerated particles a combination formed by dry blending or co-comminuting the biomass with an inorganic material, wherein the inorganic material increases the effects of irradiating the biomass in the combination, thereby producing irradiated biomass; and converting the irradiated biomass in the combination to the product using an enzyme and/or a microorganism.

2. The method of claim 1 wherein the particles comprise electrons accelerated to a speed of greater than seventy five percent of the speed of light.

3. The method of claim 1, wherein combining the biomass and the inorganic material comprises co-comminuting the biomass and the inorganic material while each is cooled to a temperature below 25°C.

4. The method of claim 3 wherein the biomass and the inorganic material are cooled to a temperature at or below 0°C.

5. The method of any of the above claims, wherein the inorganic material comprises a metal or a metal alloy.

6. The method of claim 5, wherein the metal or metal alloy is selected from the group consisting of ferrous metals, base metals, noble metals, precious metals, and transition metals.

7. The method of claim 5, wherein the inorganic material comprises aluminum metal.

8. The method of any of the above claims, wherein the inorganic material comprises a metallic compound.

9. The method of claim 8, wherein the metallic compound comprises iron or cobalt in the 2+ or 3+ oxidation state.

10. The method of any of the above claims, wherein the inorganic material comprises a refractory material.

11. The method of claim 10, wherein the refractory material is selected from the group consisting of zircon, fireclay, silica, alumina, chromite, silicon carbide, carbon, mulitite, dolomite and magnesite.

12. The method of any of the above claims, wherein the inorganic material comprises a ceramic.

13. The method of claim 12 wherein the ceramic is selected from the group consisting of oxides, carbides, borides, nitrides, silicides and kaolins.

14. The method of any of the above claims, wherein the inorganic material comprises water that is capable of leaving the inorganic material at elevated temperatures.

~~15. The method of any of the above claims, wherein the inorganic material does not have a melting point.~~

~~16~~15. The method of any of the above claims, wherein the inorganic material has a melting point of greater than about 400°C.

~~17~~16. The method of any of the above claims, wherein the inorganic material has a specific heat capacity Cp of less than about 1.5 J/g·K.

~~18~~17. The method of any of the above claims, wherein the inorganic material has a conductivity of between about 0.004 W/m·K and about 450 W/m·K.

~~19~~18. The method of any of the above claims, wherein the inorganic material has a density of greater than about 1.5 g/cm^3.

2019. The method of any of the above claims, wherein the inorganic material comprises particles having an average particle size of from about 0.1 micron to about 100 microns.

2120. The method of any of the above claims, wherein the combination includes about 0.05 to about 35 percent by weight inorganic material.

2221. The method of any of the above claims, further comprising, after irradiating, removing the inorganic material.

2322. The method of claim 1 wherein the product comprises ethanol.

2423. The method of claim 2221 wherein removing takes place after converting.

2524. The method of claim 1 wherein the microorganism comprises a yeast.