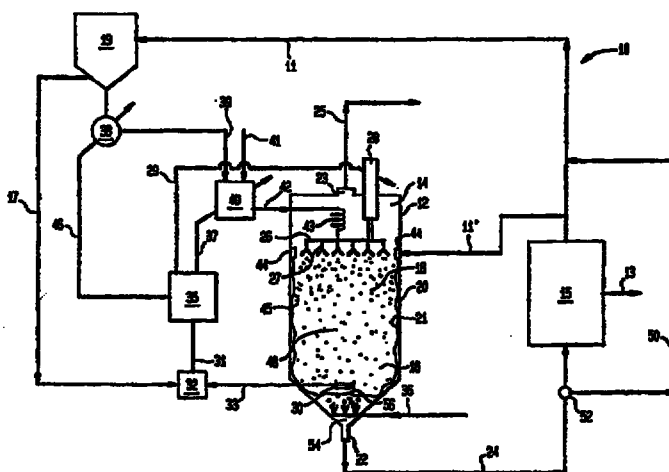


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(54) Title: **METHODS AND DEVICES FOR MAKING INTERMEDIATE OXIDATION PRODUCTS BY CONTROLLING CONVERSIONS AND TEMPERATURES IN AN ATOMIZED LIQUID**

**(57) Abstract**

Methods and devices for making intermediate oxidation products by atomizing a first liquid containing a reactant into a gas containing an oxidant in a manner to form an intermediate oxidation product different than carbon monoxide and/or carbon dioxide. The oxidation is controlled by monitoring and adjusting the temperature and conversion at one or more different stages of the reaction. The oxidation is also controlled by monitoring and adjusting the pre-coalescing transient conversion (conversion taking place in the time interval between the formation of droplets and their coalescence into a mass of liquid) of first reactant to oxidation product just before the droplets coalesce into a mass of a second liquid, or by monitoring the pre-coalescing temperature (temperature of the droplets just before they coalesce into a mass of liquid), or transient temperature difference (difference between the pre-coalescing temperature and the temperature of the droplets just before atomized), or transient temperature sub-difference (temperature difference between two positions within the reaction zone), or combination thereof. This invention provides waste minimization and considerable environmental improvement among other advantages.