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Impact of climate-friendly renewable technology on agricultural residues as remedy for environmental pollution and global warming

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Improper disposal and burning of agricultural residues are commonly practiced in some developing countries which causes environmental pollution. Harmful gaseous products are released into the atmosphere which can attribute to the problem of global warming. Renewable technology can therefore be introduced to utilize the residues to produce energy and chemical feedstock. Extraction and pyrolysis of the lignocellulosic materials from palm fruit fibre and physic nut shell were carried out under low temperature and pressure to produce energy and chemicals at various particle sizes. The main properties of solid materials were tested for and bio-oil was analyzed by GC-MS. Results are the proximate analyses (volatile, ash and fixed carbon contents) and ultimate analysis (carbon, oxygen, nitrogen, magnesium, phosphorus and zinc). The respective pH values of palm and physic residue oil ranged from 4.64 to 6.43 and 6.94 to 7.72 at 22.8°C, which increased with increase in temperatures. The density, viscosity and calorific values of the palm and physic residue oil are 831.99 and 947.5 kg/m^3, 0.695 and 1.58 cPa at room temperature, 22.33 and 14.169 kJ/g, respectively. Aromatics and compounds are major dominant compounds in the palm fruit fibre oil which is characterized for bio-fuel production. Physic nut shell oil contains aromatic ethers, cyclic ethers, secondary amides and organic halogen compound which are important chemical feedstock. Lastly, if the harmful products are released into the atmosphere continually and gradually result to depletion of ozone layer, which can cause global warming and hence has negative effects by contributing to the problems of climate change

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