

Title: Development of theories to understand bonding mechanism of primary wood components that leads to formation of densified pellets

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Abstract (250-300 words)

The bonding mechanism of primary biomass components during pellet formation is such a complex event to comprehend as the nature of the bonds formed between the combining particles have not been explicitly described with certainty from a chemistry view point due to lack of research in this area. The conditions under which particles are compressed at elevated pellet press temperatures create strong bonds between compressing particles, the nature of these bonds remains incomprehensible. This study therefore attempted to develop theories that will facilitate the understanding of the bonding mechanism of primary wood components during formation of densified wood pellets suitable for heat and power production. This was achieved through the use of specialized analytical instruments for diagnosis of various wood materials before and after pelletization. This diagnosis not only revealed primary wood components and their properties but also showed how molecules and each individual element are bonded, their binding sites, and the nature of the bonds that exists in these structures and how these are deemed relevant to the formation of densified wood pellets. The correlation between adhesion, inter–particle bonding and wood characteristics was also established.

Biography(100-150 words)

Dr. Anukam has completed his PhD in Chemistry at the University of Fort Hare in South Africa and postdoctoral studies from the Institute of Technology of the same university. He has published more than 15 papers in reputed journals and has been working as a research fellow in the department of Engineering and Chemical Sciences of Karlstad University.

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