Title:	Green Chemistry: Products and Processes
Authors:	Pradeep, D. Jeiyendira (/jspui/browse?type=author&value=Pradeep%2C+D.+Jeiyendira)
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Abstract:	The journey for a sustainable future needs Green Chemistry, which is almost like the road not taken and which has made all the difference. The future of our planet depends on clean energy, water, air, food, medicine and technology. This dream of future could be made real by greening the chemistry, which is one of the predominant underlying sciences that govern humans and their lives to a greater extent. Green chemistry is sustainable chemistry. Sustainability finds the smarter and safer ways for the current generation needs without affecting the ability of the future generations in finding the ways to their needs. Green Chemistry is all about the design of products and processes that conserves energy, uses renewable resources or safer chemicals, reduces or eliminates the production and usage of hazardous chemicals and degrades safely after its use. Whole of this work is cemented on the themes of green chemistry. The green product, I chose to work with was Biodiesel Fuel (BDF), which meets the needs of a safer and cleaner alternative to the commercial petroleum diesel. The simple looking synthesis of biodiesel is not that simple, which is why we don't find its synthesis on a large industrial scale. Its synthesis at the laboratory scale shows us the issues which one would encounter during the large scale synthesis. In this work, biodiesel, a green product has been made keeping in mind the principles of green chemistry. Possible solution to the problems which hinders the large scale synthesis of BDF is also explored. The solutions are again based on green methodologies. An independent innovation is also being recorded for the first time using which the dispersed catalysts were removed to give a clean and clear BDF. The properties of various synthesised BDF were also studied during this work. Finally a plan for the industrial synthesis of this green fuel is also charted out. A commonly generated waste material has been recycled and transformed into a useful form which can serve as a catalyst for biodiesel synthesis. Green synthesis of a nanomaterial at room temperature has been carried out, which can also act as a catalyst in the synthesis of BDF. Also, the spin-off results which emerged during the synthesis of this nanomaterial are discussed in detail.
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