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LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW KARYA ILMIAH : PROSIDING

Judul Artikel Ilmiah	:	Synthesis and characterization sugarcane bagasse	n of	graphene-like material derived from
Penulis Artikel Ilmiah	:	Dessy Ariyanti, Dina Lesdar	ntina,	Budiyono, Hantoro
Status Pengusul Identitas Prosiding	:	Penulis utama a. Nama Prosiding	:	IOP Conference Series: Materials Science and
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		h. Terindeks di (jika ada)	:	
		j. Turnitin	:	https://doc-pak.undip.ac.id/13915/3/Turnitin- C7.pdf

Kategori Publikasi	Seminar Internasional Terindeks (Scopus)
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Nilai Total = (100%)	14,70	13,40	14,05
Nilai pengusul = (0,6 x nilai total)	8,82	8,04	8,43

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Prof. Dr. Andr. Cahyo Kumoro S.T., M.T. NIP 197405231998021001 Unit kerja : Teknik Kimia FT Undip

Semarang,

Penilai 2

Prof.Dr.Ir. Bakti Jos, DEA NIP 196005011986031003 Unit kerja : Teknik Kimia FT Undip

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LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW KARYA ILMIAH : PROSIDING

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LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW KARYA ILMIAH : PROSIDING

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Synthesis and characterization of graphene-like material derived from sugarcane bagasse

Dessy Ariyanti,* Dina Lesdantina, Budiyono, and Hantoro Satriadi

Department of Chemical Engineering, Faculty of Engineering, Universitas Diponegoro, Tembalang, Semarang, INDONESIA

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Abstract. The superior ability of graphene has attracted much interest in both its development and application in various field. Graphene has been developed as material for a precursor for fabricating transparent conductive films, absorbents for environmental application, filler or additive in bioplastics, and many other applications. Graphene can be generated from carbonbased materials such as wood charcoal, sawdust, coconut shells, bagasse, rice husk, old tires, polymer-based waste, and cellulose. In this research, graphene is synthesized via Hummers route using carbon of sugarcane bagasse as raw materials. Parameter such as various addition of KMnO4 (5,10,15 gr) is observed. The characterization of the graphene such as X-Ray Diffraction (XRD), Fourier transform infra-red (FTIR) and scanning electron microscope (SEM) were used to investigate the different implication of the parameter applied during the production process. The results show that the graphene-like materials exhibit similar characteristics as published in previous works in term of crystalline structures, morphology, and its chemical bonding characteristics which can be used for diverse application as demonstrates by graphene derived from graphite exfoliation followed by reduction.

Keywords: graphene, graphene oxide, sugarcane bagasse, hummers method, biomass utilization

1. Introduction

Graphene and graphene oxide are materials that has unique chemical, optical and electrical properties because it is composed of a graphene framework and contains an oxygen functional group 1 . The materials are very promising materials to be applied in various fields such as technologies, including biosensors, drug delivery, nanoelectronics, energy storage, supercapacitors, catalysts in waste management and fillers for bioplastics ^{2, 3}. Bioplastics require improved physical and chemical properties for use in different applications. Several fillers such as silicate coatings and nanotubes are used to improve their mechanical, thermal, and rheological properties. Graphene and graphene oxide are possible to be applied as a filler or additive in bioplastics because it has a superior ability to produce improved physical and mechanical properties in the functional properties of bioplastics⁴.

The main requirement in the synthesis of graphene and graphene oxide is that the raw materials used contain carbon atoms. This carbon source can be obtained by utilizing waste including wood charcoal, sawdust, coconut shells, bagasse, rice husks, used tires, polymer and cellulose-based waste ⁵⁻⁷. One of

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Study of waste tyre granulates and polypropylene (PP) fibre as oil sorbent

Nik Khairul Irfan Nik Ab Lah, Muhammad Naqiuddin Zahid, Mohd Fazril Irfan Ahmad Fuad, Tengku Amran Tengku Mohd and Nur Shuhadah Japperi

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Abstract. There were various types of sorbent materials that exist in the current market that dealing with the oil spill incidents. However, because of high cost and incapable of repeated use, make it harder to combating oil spillage effectively and to suite environment friendly material. This study was done to assess waste tyre granulates and polypropylene (PP) fibre as oil sorbent in terms of its capacity, different type of oil absorbs and durability. Two different types of oil where used in this study in measuring the durability of the materials which are diesel and used engine oil. The sorbent capacity and re-usability tests were used to evaluate the practical sorption of each material. From the result it was found that waste tyre granulates had low oil practical sorption than PP fibre with almost 50% different. However, waste tyre granulates had high elasticity compared to PP fibre which enable it to be used repeatedly without losing its oil sorption capability. Therefore, both waste tyre granulates and PP fibre were combined to develop a new composite material sorbent that capable of recovering greater amounts of oil than using waste tyre granulates alone. The result shows that these composite material sorbent can be used repeatedly for at least 25 times.

1. Introduction

The term oil spill is used interchangeably with the oceanic or marine oil spill. The unintentional or deliberate release of crude liquid petroleum oil and other derived oil into the marine ecosystem is termed as an oil spill [1]. There were wide range modes of transportation in petroleum such as pipeline, tanker and train. Transporting oil from production area to another area especially offshore could impose some risks, such as accidental oil spills, which can cause severe damage to ecosystem and loss to human society. From 1970 to 2019, more that 5.86 million tonnes of crude oil was spilled into the oceans [2]. In Malaysia alone, records show there were 125 numbers of oil spill incident in The Strait of Malacca from 1976 to 1997 [3]. Oil spill disasters usually involve high number of casualties for both aquatic lives and birds [4][5]. Not only the environment will affect but also the human health especially people that involve in the crude oil industry [6]. Therefore, planning for oil spill disasters requires learning from previous events, yet it was challenging because it involves particular geographical conditions, ecological, societal around the vicinity [7].

Today, various method in containment of oil spill available, which the process of confining the oil either to prevent it from being spread or to divert the spillage to another area. Some common method of oil containment was using physical containment such as the deployment of sorbent. Sorbents are insoluble materials or mixtures of materials used to recover liquids through the mechanism of

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Disposal of Waste Communal in Region of Flow River on Settlement Solid Population

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Abstract. Changes that occur in housing development will change the zone that should be green open space its function to become a dense residential area. The purpose of this research is to find out how the physical condition of the toilet facilities sanitation development program for the community by the Bandung City government, such as what is the domestic waste disposal system residents, as well as to conclude how much community involvement in protecting the watersheds around the facility is also a communal toilet facility. The parameters used are the physical condition of the toilet, the existence of a septic tank, the use of a watershed, and the level of concern of the community using communal toilet facilities. This research is expected to be an evaluation material for the construction of community sanitation facilities in densely populated areas. In densely populated cities need public toilets. However, due to the lack of community participation, the condition of the facilities became damaged, dirty, and not maintained. The facility has become unsuitable for sanitation; squad latrine models are more widely used. The septic tank, which is supposed to be a waste collection facility, turns out that most domestic waste is discharged into the river through pipes. This is very unhealthy, causing pollution in watersheds. To make a government policy made that disposing of household waste from public toilets with pipes is prohibited because it causes the effects of river basin pollution, posing public health risks.

Keyword: Toilet; Sanitation; Bandung

1. Introduction

Urban residents have various characters in society. Daily activities also have various patterns and habits. The sanitation sector synergies in policy implementation [1]. Health as the basis for improving the quality of life [2], Indonesia with a high population growth rate of 1.2% per year is a high population country [3][4][5] the importance of planning as well as implementing solutions for domestic waste management [6]. The increase in population in the use of latrines occurs inequality so that adequate coverage of facilities is needed [7] and sanitation interventions have an impact not only

