

UNIVERSITI TEKNOLOGI MARA

**SPECIATION OF BIOCHEMICAL OXYGEN
DEMAND (BOD) FOR WASTEWATER AND
SURFACE WATER**

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

The Biochemical Oxygen Demand (BOD) test has been a standard test method to quantify the amount of biodegradable organic matter present in a water sample. The test is typically conducted over a 5-day period (BOD₅), with the sample being incubated at 20°C. This study aims to speciate the two organic fractions under two distinct categories termed *slow-BOD* and *fast-BOD*. Furthermore, the cBOD test also being conducted. The speciation is done by filtering the samples with filter size of 0.12 µm to separate the dissolved and particulates fractions. Twenty four of samples from variety sources have been collected and tested. The samples have been divided into five category which are discharge from sewage treatment plant (STP), industrial discharge, sullage, leachate and river water. The results showed that the speciation of slowly biodegradable fraction and fast biodegradable fraction are obviously shown in the BOD and cBOD reaction. It also has been found that five samples out of twenty four samples showed that the degradation of organic matter present is between 70-80 % in 5 days. The rest of the sample showed the degradation of the organic matter is below than 70%. Furthermore, the kinetic reaction parameter of BOD had been calculated through four different methods which are Thomas, Least-square, Fujitomo and Slope methods. From the observation, least-square is the best method followed by slope, Fujitomo and Thomas method. The kinetic reactions support the finding which the speciation of slow-BOD and fast-BOD are obviously shown in this study.

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