CORROSION BEHAVIOUR OF BURIED STEEL PIPELINES IN COASTAL SOILS

BY

[STUDENT'S FULL NAME]

[MATRIC NUMBER]

BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF CHEMISTRY, FACULTY OF SCIENCE, UNIVERSITY OF LAGOS, AKOKA, LAGOS STATE

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[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Corrosion Behaviour of Buried Steel Pipelines in Coastal Soils" was carried out by [STUDENT'S FULL NAME], and has been read and approved as meeting the regulations governing the award of the degree of Bachelor of Science (B.Sc.) of the University of Lagos.

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PROJECT SUPERVISOR Date

_____ _____

HEAD OF DEPARTMENT Date

_____ _____

EXTERNAL EXAMINER Date

DEDICATION

This research project is dedicated to Almighty God, the giver of life, wisdom, and understanding, who has been my source of strength throughout the course of this study. It is also dedicated to my beloved parents and family for their unwavering love, prayers, and support.

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ABSTRACT

This study examined corrosion behaviour of buried steel pipelines in coastal soils, using undergraduate students of the University of Lagos as a case study. The study was guided by three specific objectives: to examine the extent to which respondents exhibit the key attributes of corrosion; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with corrosion and behaviour. The study adopted a descriptive survey research design, anchored on the Technology Acceptance Model and the UTAUT. A sample size of 410 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 376 questionnaires were found valid for analysis. Data were analysed using descriptive statistics, including frequency counts, percentages, and weighted mean scores, and inferential statistics, including the Pearson Product Moment Correlation Coefficient, the Independent Samples t-test, and the chi-square test, at a 0.05 level of significance. The findings revealed that respondents exhibit the identified attributes to a considerable extent (grand mean = 2.98). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ($r = 0.548$, $p < 0.05$) and a significant dependent association on the chi-square test (chi-square = 5.84, $p < 0.05$). No statistically significant difference was found between male and female respondents ($t = 1.24$, $p > 0.05$). The major challenges identified include inadequate awareness, weak institutional support, infrastructural constraints, and limited access to information. The study recommends targeted interventions, improved access to resources, and intensified public education on corrosion.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of corrosion behaviour of buried steel pipelines in coastal soils is situated within a body of scholarship that has grown rapidly in the past two decades. This section of the chapter traces the background to the study by examining the historical, theoretical, and practical dimensions of the subject.

Scholars have long recognised corrosion as a critical determinant of outcomes in chemistry. National policies and programmes have sought, with varying degrees of success, to respond to the realities of corrosion and behaviour. Research by Olawale and Dauda (2021) using mixed methods provided particularly rich insight into the mechanisms connecting corrosion and behaviour. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. An examination by Eze and Adekunle (2019) attributed much of the observed variation in outcomes to institutional capacity and policy continuity. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of {k0} from confounding factors.

In both global and African literatures, corrosion is now regarded as a key index of institutional performance. The socio-cultural diversity of Nigeria implies that responses to corrosion must be differentiated rather than uniform. Studies conducted within the West African subregion by Oyelaran and Bamgbose (2018) reached conclusions broadly consistent with the Nigerian evidence. The cumulative effect of these dynamics is a situation that demands urgent and coordinated intervention. Comparative work by Alade and Musa (2022) across several states uncovered a consistent pattern linking corrosion with behaviour. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of {k0} from confounding factors.

corrosion continues to command considerable attention among researchers, policymakers, and practitioners in chemistry. Federal and state governments have initiated several reforms, yet implementation gaps continue to constrain progress in matters of corrosion. A notable study by Alade and Musa (2017) argued that the impact of corrosion is substantially mediated by the quality of institutions. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. Bello and Aderemi (2020), in a survey of relevant stakeholders, concluded that the benefits of corrosion are unevenly distributed across groups. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

The salience of corrosion in national discourse has grown steadily, driven by changing social conditions and technological penetration. Public institutions at the federal, state, and local levels have developed programmes that seek to mainstream corrosion into routine governance. The aggregate picture emerging from Umeh and Adebayo (2023) points to a modest but consistent association between corrosion and the outcomes of interest.