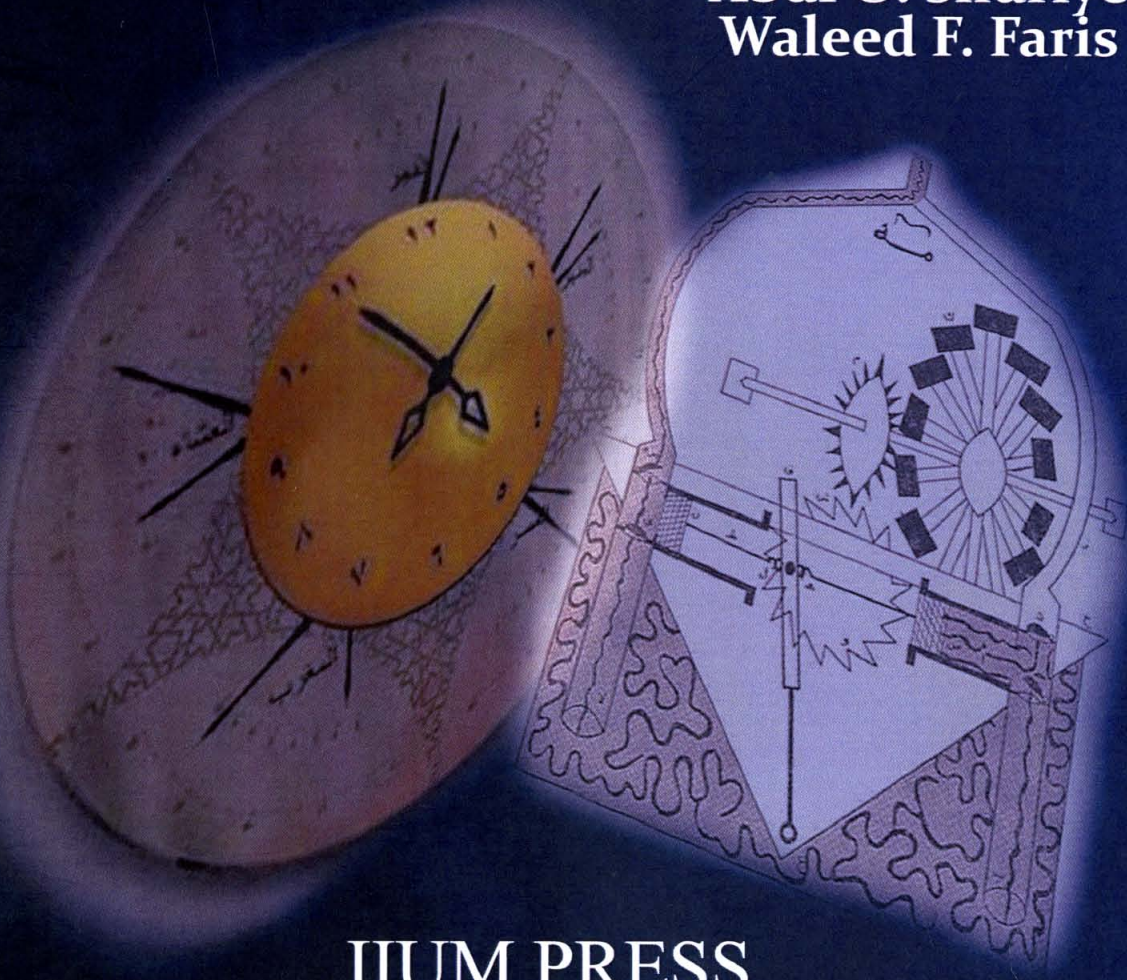


# Contributions of Early Muslim Scientists to Engineering Studies and Related Sciences

Abdi O. Shuriye  
Waleed F. Faris



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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA





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## **Editors**

Abdi O. Shuriye  
Waleed F. Faris



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EMAIL: iiumprinting@yahoo.com

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## CHAPTER SIX

### JABIR IBN HAYYAN'S WORK ON SULPHUR-MERCURY THEORY

Adib Hamdani B Rosli, Amir A. Shafie

*Fac. of Eng., International Islamic Univ. Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia.*

#### 6.1 INTRODUCTION

The objectives of this chapter are to explain origin of sulphur-mercury theory proposed by Jabir ibn Hayyan, a Muslim alchemist as well as its contribution –directly and indirectly, to the alchemy and later, modern chemistry world. The significance of this chapter is its ability to highlight the importance of sulphur-mercury theory during middle-ages in alchemical field of study, as well as how the theory became the basis for several theories in chemistry centuries later, namely acid-base theory and *terra pinguis* concept. The methods used in this chapter are collection of academic references in terms of books and journals, as well as reliable online references. The chapter framework covers the origin of sulphur-mercury theory –which is dated back to the time of Aristotle, and the importance or contribution of the theory to alchemical as well as chemistry fields.

#### 6.2 THE ORIGIN OF SULPHUR-MERCURY THEORY OF METALS: FROM THE TIME OF ARISTOTLE

Sulphur-Mercury Theory of Metals was proposed by Jabir ibn Hayyan alAzdl (721-815) -a Muslim alchemist and physician, who is an expert in multi-dimensional fields. The Houran-born alchemist adopted the sulphur-mercury theory from ancient Greek's theory of four elements, which was originated from Aristotle's idea of exhalations [Zanariah, Salina, et.al, 2007, p.187]. According to Gill (1989), while discussing about unity of substance, Aristotle mentioned there are four essential properties of the elements, which are the hot, wet, cold and dry [Gill, 1989, p.241]. Kauffman (1985) explains how metals and minerals are produced from the earth through heating from the sun:

‘Geber's (Jabir's) sulphur-mercury theory derived from Aristotle's idea of exhalations. The earth gives off two kinds of exhalations when heated by the sun — one vaporous, cool and moist, the other windy and smoky. The vaporous produces metals from water in and on the earth. The smoky produces minerals from the earth itself’ (Kauffman, 1985, p.41)

Nevertheless, Aristotle never experimented nor proved his theory of elementary properties, though in general, alchemists believed on this theory's basis. Jabir simplified Aristotle's theory, with additional specific idea, namely the balance and proportion. Four