



From Alchemy to Chemistry: In Search of Gold

Vocabulary

ALLEGE [v.]—claim, assert, contend

CONCUR [v.]—agree, coincide, harmonize

DIVULGE[v.] —reveal, tell, disclose

ERUDITE [adj.] —scholarly, well-read, well educated

GENEALOGY[n.] —family tree, lineage, pedigree

LUMINOUS [adj.]—radiant, brilliant, gleaming

OCCULT [n.] —magical, mystical, supernatural

SCRUTINIZE [v.] —inspect, analyze, examine

UNDERVALUE[v.] —underestimate, underrate, devalue

VISAGE [n.] —face, appearance, mien

Au [Gold] Atomic Number 79

Human beings have been fascinated by the **luminous** quality of gold, the chemical element that will not tarnish in either air or water. Throughout the Middle Ages and the Renaissance, one of the alchemist's primary goals was to discover a method to transmute baser metals--iron [Fe 26], nickel [Ni 28], lead [Pb 82], and zinc [Zn 30] into gold. Alchemy, a pseudoscientific predecessor of chemistry, was a speculative philosophy that was also concerned with finding a universal solvent, which is a liquid that dissolve other liquids, but does not change its state in forming solutions. The alchemists' third goal was to discover an elixir to prolong life indefinitely. To avoid **divulging** secrets, the processes of alchemy were usually expressed in allegorical symbols, such as the dragon, the salamander, and the ouroboros—the encircled serpent that eats its own tail. Other allegorical symbols, like the circled dot and ⚞, the alchemical symbol for Sulphur [S 16], are associated with the **occult**. The work of these early alchemists is generally unintelligible and **undervalued**.



Jàbir ibn Hayyàn

Artistic depiction of the **visage** of Islamic alchemist, [https://en.wikipedia.org/wiki/Jabir_ibn_Hayyan]

In 9th century, an **erudite** Muslim alchemist/chemist Jàbir ibn Hayyàn [known in Europe by the Latinized "Geber" for "Jàbir"] began a systematic and experimental approach to the study of chemistry. Unlike Greek and Egyptian alchemists, his work was based on scientific investigation in a laboratory. He invented the alembic (al-anbiq) alchemical still, which consists of two vessels connected by a tube to distill chemicals. The ALEMBIC symbol is (). Jàbir distinguished *alkalis* or bases and acids, and identified mercury and sulfur as chemical elements, although these are not the same chemical elements recognized by modern era chemists.

Chemistry has a two-parent **genealogy**. The first actual chemist was a Mesopotamian woman, Tapputi, who pioneered the process of distillation. She is mentioned in a cuneiform tablet from the second millennium BC in Babylonian Mesopotamia [modern day Iraq] where she was known as Tapputi-Belatekalim. "Belatekalim" refers to a female overseer of a palace. Tapputi used flowers, oil, and calamus along with cyperus, myrrh, and balsam. She added water, then distilled and filtered several times, as she made perfume. This ancient tablet also alludes to the oldest referenced still.

Robert Boyle clearly differentiates between chemistry and alchemy in his work *The Sceptical Chemist* (1661). While Boyle is credited as being the Father of Chemistry, his work has been subjected to intense **scrutiny** by scholars who **allege** that Boyle presented some of the earliest ideas of atoms, molecules, and chemical reactions.

Antoine Lavoisier, however, is known as the father of Modern Chemistry. Among Lavoisier's contributions to modern chemistry is the standardization of chemistry nomenclature, the listing of elements, and the description of the properties of matter.



Select the correct synonym or antonym of the underlined words.

Human beings have been fascinated by the luminous quality of gold, the chemical element that will not tarnish in either air or water.

1. The word luminous is closest in meaning to

- A. rich
- B. yellow
- C. sparkling
- D. magical

To avoid divulging secrets, the processes of alchemy were usually expressed in allegorical symbols, such as the dragon, the salamander, and encircled serpent that eats its own tail.

2. The word divulging in this sentence means all of the following EXCEPT

- A. revealing
- B. disclosing
- C. exposing
- D. concealing

The work of these early alchemists is generally unintelligible and undervalued.

3. The word undervalued is closest in meaning to

- A. fictitious
- B. abridged
- C. autobiographical
- D. diminished



Other allegorical symbols, like the circled dot and ⚞ , the alchemical symbol for Sulphur [S 16], are associated with the occult.

4. The word occult is closest in meaning to

- A. zenith
- B. edifice
- C. mystical
- D. façade

In the ninth century, an erudite Muslim alchemist/chemist Jàbir ibn Hayyàn [known in Europe by the Latinized "Geber" for "Jàbir"] began a systematic and experimental approach to the study of chemistry.

5. The word erudite is closest in meaning to

- A. scholarly
- B. confident
- C. arid
- D. underestimated

Chemistry has a two-parent genealogy.

6. The word genealogy means all of the following EXCEPT

- A. benefactors
- B. lineage
- C. ancestry
- D. descent



While Boyle is credited as being the Father of Chemistry, his work has been subjected to intense scrutiny by scholars who note that Boyle was an alchemist who believed that the transmutation of base metals into gold was possible.

7. The word scrutiny is closest in meaning to

- A. concurrence
- B. instigation
- C. allegation
- D. examination

While Boyle is credited as being the Father of Chemistry, his work has been subjected to intense scrutiny by scholars who allege that Boyle was an alchemist who believed that the transmutation of base metals into gold was possible.

8. The word allege in this sentence means all of the following EXCEPT

- A. claim
- B. assert
- C. suspect
- D. contend

Nonetheless, researchers concur that Boyle presented some of the earliest ideas of atoms, molecules, and chemical reactions.

9. The word concur as used in this sentence is closest in meaning to

- A. differ



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- B. question
- C. agree
- D. bristle

The passage offers an artistic depiction of the visage of Islamic alchemist, Jàbir ibn Hayyàn.

10. The word visage is closest in meaning to

- A. biography
- B. appearance
- C. reputation
- D. skull

Answer Key: 1. C, 2. D, 3. D, 4. C, 5. A, 6. A., 7. D, 8. C, 9. C, 10. B