



**TAKHRIJ AND SYARAH HADITH OF CHEMICAL: CORROSION PREVENTION ON THE  
IRON**

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**Abstract**

The purpose of this research is to discuss the hadith of the Prophet Muhammad saw. about iron corrosion. This research method is qualitative through the takhrij and syarah hadith approaches with chemical analysis. The result and discussion of this research is that corrosion of iron can be prevented by using natural extract inhibitors, one of which is the pine sap inhibitor which is proven to be the most effective in preventing the corrosion rate. The conclusion of this research is takhrij and syarah hadith of the Prophet Muhammad saw. about iron corrosion by chemical analysis has the opportunity to develop methods of preventing corrosion of iron using natural materials.

**Keywords:** Chemistry, Corrosion, Hadith, Syarah, Takhrij

**Introduction**

Iron is a chemical element that is classified as a transition metal with the symbol Fe on the periodic table. Based on its chemical properties, the reduction potential of iron is quite negative so that during its use it is very susceptible to corrosion (Sudiarti et al., 2018). Corrosion is the process of degradation of a metal material due to chemical reactions, especially electrochemical reactions with the environment (Sudiarti et al., 2018). Electrochemical reactions form a closed circuit due to reactions that occur simultaneously in the anode and cathode regions (Haryono et al., 2010). There are several ways to prevent corrosion, one of which is the addition of a corrosion inhibitor. Corrosion inhibitors are a method of reducing the rate of corrosion by adding a small amount of the substance to the electrolyte environment (Haryono et al., 2010). Even though it is in great demand, the use of inhibitors derived from synthetic chemicals has negative impacts, including being quite dangerous, not environmentally friendly and quite expensive. Therefore, inhibitors from natural extracts are a safe, easy, inexpensive, and environmentally friendly solution (Haryono et al., 2010).

There is a hadith of the Prophet saw. with regard to iron corrosion in Shahih Al-Bukhari Number 1738:



حَدَّثَنَا عَبْدُ اللَّهِ بْنُ يُسُفَ أَخْبَرَنَا مَالِكٌ عَنْ يَحْيَى بْنِ سَعِيدٍ قَالَ سَمِعْتُ أَبَا الْحُبَابِ سَعِيدَ بْنَ يَسَارٍ يَقُولُ سَمِعْتُ أَبَا هُرَيْرَةَ رَضِيَ اللَّهُ عَنْهُ يَقُولُ قَالَ رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ أُمِرْتُ بِقَرِيَّةٍ تَأْكُلُ الْقُرَى يَقُولُونَ يَثْرِبُ وَهِيَ الْمَدِينَةُ تَنْفِي النَّاسَ كَمَا يَنْفِي الْكَبِيرُ حَبَثَ الْحَدِيدِ

Having told us 'Abdullah bin Yusuf told us Malik from Yahya bin Sa'id said, I heard Abu Al-Hubab Sa'id bin Yasar said; I heard narrated Abu Hurairah radhiallahu'anhu : Rasulullah (ﷺ) said, "I was ordered to migrate to a town which will swallow (conquer) other towns and is called Yathrib and that is Medina, and it turns out (bad) persons as a furnace removes the iron rust " (HR. Bukhari).

Based on the explanation above, a research formula is prepared, namely the formulation of the problem, research questions, and research objectives (Darmalaksana, 2020a). The formulation of this problem is that there is a hadith from the Prophet saw. about iron corrosion. The research question is how the hadith of the Prophet saw. about iron corrosion. The purpose of this research is to discuss the hadith of the Prophet saw. about iron corrosion.

## Research Methods

This research method is qualitative through literature and field studies (Darmalaksana, 2020b). While the methods applied are takhrij and syarah hadith (Soetari, 2015). The interpretation in this research used an approach with chemical analysis (Sudiarti et al., 2018).

In general, there are two stages of research on hadith, namely takhrij and syarah. Takhrij is the process of extracting a hadith from a hadith book to examine its validity, while syarah is an explanation of the hadith text with a certain analysis (Soetari, 2015). Chemistry, as a means of interpretation in this research, is a field of study that studies all material in the natural surroundings, both natural and artificial, the properties of matter, the structure of matter, changes in matter and energy involved in that changing matter (Wasilah, 2012).

## Results and Discussion

At first, a search was carried out through the hadith application regarding the keyword "iron rust" until the hadith was found in the Shahih Al-Bukhari Book Number 1738, as stated earlier.



Tabel 1. List of Rawi Sanad

| No. | Rawi Sanad                             | Birth / Death |        | Country | Kunyah                      | Ulama's Comments |  | Circles                     |
|-----|--|---------------|--------|---------|-----------------------------|------------------|--|-----------------------------|
|     |  | B             | D      |         |                             | -                | +  |                             |
| 1   | Abdur Rahman bin Shakhr                |               | 57 H.  | Madinah | Abu Hurairah                |                  | Friend   | Friend                      |
| 2   | Sa'id bin Yasar                        |               | 117 H. | Madinah | Abu Al Habbab               |                  | -Tsiqah<br>-Tsiqah<br>-Tsiqah<br>-Tsiqah<br>-Tsiqah  | Tabi'in middle circle       |
| 3   | Yahya bin Sa'id bin Qais               |               | 144 H. | Madinah | Abu Sa'id                   |                  | -Tsiqah<br>-Paling tsabat<br>-Tsiqah<br>-Tsiqah ma'mun<br>-Tsiqah<br>-Tsiqah<br>-Tsiqah<br>-Tsiqah tsabat<br>-imam | Tabi'in ordinary circle     |
| 4   | Malik bin Anas bin Malik bin Abi 'Amir |               | 179 H. | Madinah | Abu 'Abdullah               |                  | -Tsiqah<br>-Tsiqah ma'mun  | Tabi'ut elderly Tabi'in the |
| 5   | Abdullah bin Yusuf                     |               | 218 H. | Maru    | Abu Muhammad                |                  | -Tsiqah<br>-mentioned in 'ats tsiqaat<br>-Tsiqah<br>-Hafizh  | Tabi'ul elderly Atba' the   |
| 6   | Imam Al-Bukhari                        | 194 H.        | 256 H. | Bukhara | Amirul Mukmi nin fil Hadits |                  | Imam al-hadits   | Mudawin                     |

Table 1 is a list of the rawi and sanad hadith under research. Rawi is the narrator of hadith while sanad is the chain of narrators from friend to mudawin, namely ulama's who record hadiths in the hadith book (Soetari, 1994). According to the science of hadith, the requirement for shahih hadith is that rawi must be positive according to the comments of the ulama's. If there is a comment from a ulama's who gives a negative assessment to one of the narrators in the sanad lane, then the hadith is a hadith dhaif (Darmalaksana, 2020d). Shahih hadith are strong hadith while dhaif hadith are weak hadith (Soetari, 1994). Requirements for shahih hadith must also be continued. If the hadith sanad is broken, then the hadith is a dhaif hadith. The proof of continuity is meeting between teacher and student. If there is no objective evidence, the encounter between teacher and student can be seen from birth and death. If there is no data on births and deaths, it is predicted that the average age of ulama's is around 70-90 years. The meeting of teachers and students can also be seen from the narrator's life journey. If the teacher and student are in the same place, it is predicted that the teacher and student met (Darmalaksana, 2020d).

The quality of this hadith is shahih. Because, from the side of the narrator, there were no comments from ulama's who gave negative assessments. Also from the sanad side, it is connected from friend to mudawin. Basically the science of hadith has another parameter in providing reinforcement to hadith. Among other things, hadith are called mutawatir in a very popular sense if the hadith being researched



are scattered in several hadith books (Soetari, 2015). The distribution of this hadith acts as syahid and mutabi. Syahid is another hadith of a kind whereas mutabi is another sanad (Darmalaksana, 2020d). The rest, hadith so far is the virtue of Islamic practice, so it can be argued even though its status is dhaif (Darmalaksana et al., 2017).

The ulama's have given syarah, namely an explanation of the content and meaning of the hadith (Darmalaksana, 2020c). According to the ulama's view, Tasybih (likeness) is a factor indicating that what is meant is bad people. The purpose of the history of using the word tanqi (cleaning) in place of the word tanfi (removing) is human in general. It is stated in the hadith that "Medina brings out what is bad" **أُمِرْتُ بِقَرْيَةٍ** (I was ordered to a village), namely I (Rasulullah saw.,) was ordered by my Lord to migrate to a village, or I was ordered to live in it. Divided into two interpretations, namely: 1) Understood on the basis of what he said in Mecca; and 2) It is understood that he said this while in Medina.

The command aims to (eat the villages), which means to dominate or defeat other villages. The word "eat" is used to express the word "dominate or defeat", because the person who is eating controls what he eats. In the hadith it is explained that before Medina expels bad people like a blacksmith's fire blower lifting iron rust from iron, there will never be a Day of Judgment. This shows the uniqueness of the city of Medina, as a place of hijrah for the Prophet Muhammad saw., and as a city that is protected by Allah SWT its holiness, so that the existence of dirty-hearted people will not be allowed (Salma, 2016).

The information regarding rusted iron and removing iron rust by burning with fire until it boils is information related to science, so it is very useful for Muslims and can be responded positively by scientists (Ibnu Hajar Al-Asqalani, 2013: 363-368) (Salma, 2016).

This hadith can also be explained in terms of chemistry. Iron corrosion that occurs due to environmental influences can be prevented by using natural extract inhibitors, especially compounds consisting of oxygen, sulfur, phosphorus, nitrogen, and other atoms that have PEB or lone pairs (Istiqlaliyah & Candrama, 2018). Atoms that have PEB act as ligands or electron donors that will form complex compounds with iron. These complex compounds are stable, do not easily undergo oxidation and will protect the metal surface, thereby inhibiting the rate of corrosion (Putra et al., 2018).

The method of extracting natural ingredients is carried out by extraction and distillation processes. Extraction is carried out using several materials that have been mashed and wrapped in filter paper which is then put into soxhlet. The solvent used in the extraction process is water. After the process is complete, the extract solution is then distilled to separate it from the solvent. Some natural ingredients that can be used include tobacco leaf extract, tea leaves, aloe vera, papaya leaves, coffee, gambier leaves, and pine sap.

Extracts of tea, coffee and tobacco leaves are effective as corrosion inhibitors because the three natural ingredients have the element N which acts as an electron donor so that the Fe<sup>2+</sup> metal can form complex compounds and produce a more stable product. Coffee contains caffeine compounds (C<sub>8</sub>H<sub>10</sub>N<sub>4</sub>O<sub>2</sub>) which has a purine ring and is an alkaloid compound. Papaya leaves contain amino acids, N-acetylglucosaminide, and benzyl isothiocyanate. Aloe vera contains amino acids, aloesin, aloin, and alloenin. Tobacco leaves contain nicotine, alanine, aniline, amines, pyridine, hydrazine, quinoline and others.



Tea leaves contain more caffeine compounds than coffee. All of the natural ingredients above are inseparable from the nitrogen content in their chemical compounds, so they can be effectively used as corrosion inhibitors (Ahmadi et al., 2016). Among these natural ingredients, pine sap is the most effective inhibitor and gambier is the less effective inhibitor in preventing the rate of corrosion (Haryono et al., 2010).

## Conclusion

Iron as a metal that is recognized as having extraordinary strength has a disadvantage, namely that it is prone to corrosion. The phenomenon of corrosion on iron and how to get rid of it has been informed in the hadith of the Prophet saw. since hundreds of years ago. In chemistry, the corrosion rate can be prevented using natural extract inhibitors. Pine sap is one of the most effective natural extract inhibitors to prevent corrosion. Based on the hadith takhrij, the quality of this hadith is shahih because the sanad of the hadith are continued from friend to mudawin. This research is expected to be useful for the development of corrosion prevention in iron. This research has limitations, namely simple takhrij and syarah hadith, so it requires in-depth follow-up through chemistry. This research recommends the development of a more modern iron corrosion prevention with a chemical approach.

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