



Letter from Svante Arrhenius to Georg Bredig, July 1901

Arrhenius, Svante. "Letter from Svante Arrhenius to Georg Bredig, July 1901," July 12, 1901. Papers of Georg and Max Bredig, Box 1, Folder 4. Science History Institute. Philadelphia. <https://digital.sciencehistory.org/works/4mggrut>.

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Translated by Jocelyn R. McDaniel

English Translation

Image 1

Copenhagen, 12 July 1901

My dear friend Bredig,

Your letter, which I received yesterday, pleased me greatly and I would like to promptly reply in order to warmly congratulate on your new position. You had to wait a very long time to find a position that was more or less appropriate for your work. It is also encouraging that you will work with Abegg, who has been a professor for several years. On a side note, I must confess objectively that Heidelberg is more pleasant than Wroclaw. However, since you have many personal and professional relationships in Wroclaw, this can be a decisive factor. You will quickly adjust to life in the pleasant city on the Neckar River again. Moreover, the scientific atmosphere there is more dynamic than in Wroclaw.

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I hope to attend the meeting of natural scientists in Hamburg this year. The discussion on ions and the Heisler survey both interest me. I am now working on this with Madsen, but we haven't made much progress. Things are very complex, and the reaction is greatly influenced by the temperature, so that it's difficult to deduce results. We are working with horse blood in-vitro, so that the conditions are relatively simple compared to those in animal experiments. Hopefully we'll achieve some results in the end.

With regards to my disagreement with Jahn and Nernst, the general opinion seems to be that Nernst has acted in a very callous manner. This occurred even after Ostwald's influence quelled the worst of his rudeness. I was afraid that Nernst would resent the fact that Helmholtz' deduction was preferred to his. I therefore attempted to quote Nernst's own words on this delicate matter so as not to claim anything different from what Nernst had independently determined. His deduction in the journal Wied. Ann. is inadequate. He doesn't describe the conditions under which the experiment was conducted. In general, Nernst always claims that the laws of dilution for saline solutions are always acceptable.

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He says that $\mu_0 = \mu_\infty$ is not a correct measurement for the degree of dissociation. However, this probability is only based on the fact that the law of dilution cannot be applied to these values. I am convinced that for large dilutions, $\mu_0 = \mu_\infty$ yields extremely correct values for the degree of dissociation. Why should it be different than acids? This is only an empirical fact, and I do not believe that Nernst's theoretical considerations can change the facts substantially. The measurements with electronic forces cannot yield anything other than the ones above the freezing point, and it seems to me that these can be made more precisely. However, the freezing point tests for salt solutions coincide with the values calculated from $\mu_0 = \mu_\infty$. This is an empirical fact than can only be jeopardized by new measurements, but not by theoretical measurements. It was a shame that I didn't have time to properly work through Jahn's new deduction before I traveled to Copenhagen. J. now expects a lot from this new law. I think he will have a lot of problems with that too.

Image 3

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Regardless, he now has a constant to refine through experimentation. Afterwards, the new formula will be better than the old one.

In any case, Jahn's whole approach, which he made so much noise about, was not very

successful. Needless to say, Jahn and Nernst continue to discredit $\mu_0 = \mu_\infty$, especially since they admired this view so much. The discussion will nevertheless be of interest to others.

At the beginning of August, I will return to Stockholm, and importantly, Uppsala, where I plan to stay with my mother until the beginning of September. I will continue to write my book on cosmic physics, which I hope to finish by Christmas (i.e., in the manuscript).

Many thanks for your essays. I was very interested to read the one on gold salts yesterday evening. Madsen asked me to convey his thanks for kindly sending the parcel and letter. Say hello to your wife and our dear friends in Leipzig.

Yours truly,
Svante Arrhenius

(Madsen also says hello)