



Philosophical Magazine Series 5

ISSN: 1941-5982 (Print) 1941-5990 (Online) Journal homepage: <http://www.tandfonline.com/loi/tphm16>

On the electrical series for frictional electricity

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To cite this article: J. Schiff (1890) On the electrical series for frictional electricity, Philosophical Magazine Series 5, 30:183, 204-204, DOI: [10.1080/14786449008621381](https://doi.org/10.1080/14786449008621381)

To link to this article: <http://dx.doi.org/10.1080/14786449008621381>



Published online: 08 May 2009.



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which, however, are congruent. Potassium is similar, while rubidium and caesium again have only two secondary series, which are congruent. The congruence, which in the formula of the series expresses itself by identity of the second and third constants for the two series, has the effect that two such congruent series appear as a series of pairs, but in which the difference of vibration of both lines of the pairs is constant for each series, in opposition to the deportment of the chief series.

The result comes out that this difference of vibration of the pairs of the secondary series is identical for each element with the difference of vibration of the first pair of the principal series $n=3$. It has further come out that the magnitude of this difference of vibration is connected with the atomic weight; *the difference of vibration is very nearly proportional to the square of the atomic weight*. With lithium no pairs are visible; this law extended to lithium enables us to calculate from its atomic weight that the difference of possible pairs would be so small that we should probably see the lines double.

If we compare the spectra of the alkalis with each other, it is most distinctly evident that both the chief series as well as the secondary series extend towards the red side of the spectrum. This is of course just as apparent in the constants A, B, C, which change, in a manner obviously expressed by a law, from one element to another. It is worthy of mention that the constant B changes very little, and is the same, not only for the alkalis, but, as seems to be the case, for other elements also.

We consider it premature to try to discover the law according to which the constants vary from one element to another before we have investigated other elements. We hope before long to lay before the Academy our results in reference to the alkaline earths.

As a further result of our investigations we must mention that, in contradiction to the statements of Lockyer, who considered that he had found the lines of all pair alkalis among those of Fraunhofer, only sodium is represented in the Sun, and probably also only its chief series.—*Sitzungsberichte der Berliner Akademie*, June 5, 1890.

ON THE ELECTRICAL SERIES FOR FRICTIONAL ELECTRICITY.

BY J. SCHIFF.

The author gives the following series for frictional electricity:—hair skins, smooth glass, wool, ground glass, silk, resins, collodium, steatite.—*Beiblätter der Physik*, vol. xiv. p. 525.