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# Rubidium ($Rb^{37}$)

## Properties

Similar to other alkaline metals, Rubidium is a silvery-while, soft and highly reactive. It has an atomic mass of 85.468 u. Rb has a density of 1.532 g/cm$^3$, a melting point of 39.30 $^o$C and a resistivity of 12.8 µOhm cm. It is very soft and has a Brinell hardness of 0.216 MPa.

Like Lithium, the free metal does not occur in nature, but occurs naturally in the minerals including leucite, pollucite, carnallite, and zinnwaldite. Rubidium is the twenty third most abundant element in the Earth's crust and is found in the forms of the stable $^{85}$Rb (72.2%) and the radioactive $^{87}$Rb (27.8%) species[1]. The abundance of rubidium in the Earth's crust is 90 parts per million by weight.

The most common oxidation state for rubidium is +1, but –1 was also has been reported. It is generally more reactive than potassium and less reactive than caesium. Like the other alkali metals (lithium, sodium, potassium, caesium and francium), rubidium reacts violently with water, oxidizes when reacting with oxygen, and ignites due to humidity in the air. Rubidium metal is highly reducing, with the standard reduction potential for the $Rb^+$/Rb couple being −2.98V.

## Plating Solutions

Rubidium is similar to other alkaline metals and difficult to deposit electrochemically and ionic liquids are one of the only electrolytes usable. Rubidium can be plated from Rubidium chloride salt in 4-butyro lactone at 70 °C [2].

## Applications

Rubidium has a lot of applications in electronics and medicine. It's been used in telecommunication industry, atomic clocks, various photocell devices, and as an inexpensive diode laser light at the relevant wavelength. It also has various applications in medicine. It's been used in nuclear medicine as rubidium collects more in brain tumors than normal brain tissue, allowing the use of radioisotope rubidium-82 in nuclear medicine to locate and image brain tumors. Finally, rubidium is ideal for monitoring ischemia.

## References:

[1] W. W. Strong. *Phys. Rev. (Series I)* **29**(2), 170–173, 1909.
[2] Application PCT WO2014148227A1, published 09/25/2014.

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