

Glauber's Salt: $\text{Na}_2\text{SO}_4 \cdot 10 \text{H}_2\text{O}$

— A Classic of Science

Chemistry

THE WORKS OF THE HIGHLY EXPERIENCED AND FAMOUS CHYMIST, JOHN RUDOLPH GLAUBER: Containing great variety of choice secrets in Medicine and Alchymy, in the working of Metallick Mines, and the separation of Metals: also various cheap and easie ways of making Salt-petre, and improving of Barren-land, and the Fruits of the Earth. Together with many other things very profitable for all the Lovers of Art and Industry. Translated into English, and Published for Publick Good by the Labour, Care, and Charge, of Christopher Packe, Philo-chymico-Medicus. London, MDCLXXXIX (1689).

A most easie Way of acquiring Spirit of Salt together with the Sal Mirabile.

R. of common salt two parts, dissolve it in a sufficient quantity of common water; pour *A.* upon the solution; put the mixture into a glass Body, or a glass Retort well coated, or else into an earthen Body or Retort. If a Body, set on an Head, and begin to destil with Fire of sand, encreasing your Fire gradually; with the first heat comes off the unsavoury Phlegm, which gather apart; when the Liquor comes forth sowrish, change your Receiver and receive the sowre spirit: Continue the operation till no more spirits will arise, then let out the Fire, and permit the Vessel to stand in sand till all is cooled, when cold, take it out, and if it be unbroke, fill it again with the aforesaid matter, and proceed as we taught: The phlegm is not to be cast away, but must be kept, that in it may be dissolved Salt (because it is better than common Water) for another distillation. Thus from every pound of salt you will have lb. j. of the best and most pure spirit. Dissolve the salt remaining in the Body or Retort (if neither be broke) in Water, filter and evaporate the Water, let it crystallize, the Crystals will be white, endowed with wonderful Virtues, to be declared here following. . .

Glauber's directions for preparing his salt are perfectly valid today. The initial R is of course the familiar symbol which still begins prescriptions. A is sulphuric acid—oil of vitriol, if Glauber had written it out. Fire of sand is our sand bath. In describing his preparation, Glauber gives us an interesting medley of properties, some of sodium sulphate alone, some of salts in general, phenomena of solution, of crystallization, and of colloid reactions. Most of them are recognizable, but it must be admitted that the author occasionally draws a long bow in his enthusiasm for his discovery.

Of the Utility which our Salt of Art contributes unto all Men, of what state or condition soever they be.

THE utility of this is very great, for if seeds, before they be sowed, be steeped in it, they will yield an incredible encrease; which is a thing of very great concern to all men dwelling on the Earth, because they shall never sustain the want of Bread.

And will not the Husband-man, gathering in his Fruits for less labour and charge than in the vulgar manner, be able the more certainly to pay his Dues to the Magistrate?

Of Artificers also the Reason is the same; because they being hereby better able to exercise their Crafts, may also return the benefits thereof to their superiors.

Unto Physicians, by the help of this, are known more excellent Medicaments, and they being present, more speedy and certain relief is procured to the sick.

So it is with Apothecaries, Chirurions, and their Medicines, Plasters, and Unguents, which by this are more perfectly prepared, and therefore the Cure is sooner, and more happily absolved, than by Medicines vulgarly known.

And I believe every Artificer and Trading Man, when he can perform his Work with less labour and charge, and acquire his Wares for less trouble and cost, will sell his Commodities to his Neighbors, at a cheaper rate than he could before he found the benefit of this salt.

Husbandmen and Gardeners, and other such labouring men, when they

can more easily, sooner, and more abundantly reap their Fruits than before, cannot chuse but sell to the buyers for less price than they could afford them at when they had no benefit of this.

Thus we generally see, of how great Utility our *Salt of Art* is, or what benefits may thence redound to men of every condition. What man, considering these things, will not employ all his faculties that he may become the Master of such a salt, whence he may not only benefit himself, but his Neighbor also?

Of the Use of this Sal Mirabile in Medicine

THIS salt ought to be numbred among Universal Purgers, for by a Magnetick Virtue it extracts all sorts of noxious humours out of the Body.

2. This purging Property is augmented by Metallick or Mineral Bodies dissolved in it.

3. For expelling all depraved humours, the most profitable to be dissolved in it, is Antimony; when the Medicine is to be appropriated to the Heart, Gold; when to the Brain, Silver; to the Liver, Spleen, and Reins, Iron; to the Lungs, Tin and Sulphur; to the Habit of the Body, Copper and Mercury.

4. If purging Vegetables, Minerals, and Animals be boiled in the Water in which this salt is dissolved, and that decoction be used in a Clyster, we know all corrupt humours will be evacuated thereby.

5. In all those Persons, young or old, which cannot or will not take purging Medicaments, either by the mouth or otherwise, it will be very profitable to free their bodies from corrupt humours, to make suppositories of Honey and this salt mixed.

6. In *Head-achs*, all *Fevers*, and the *Epilepse*, it will deserve the praises of a suitable Purger.

7. In *Catarrhs*, when the Head is full of Phlegmatick Humours, half a grane, or a whole grane of this snuffed up the Nostrils early in the morning, or in the day-time, wonderfully evacuates the Phlegm.

8. It is an admirable Remedy in Affects of the Jaws, and parts adjacent, as the Tongue, Tonsils, Cheeks,

and Gums, having their original from a sharp Catarrh falling down, and oftentimes conjoined with Ulceration and Corruption, as is frequently known to happen in Scorbutick Diseases. For it extracts the humours causing the *Evil*, and heals the part vitiated, if it (dissolved in Water) be often used hot as a *Gargarism*, and the use of Purging not neglected.

9. In like manner in the *Tooth-ach* it performs Wonders, drawing out the Humours causing dolour in the Teeth; if as much as will lie on the point of a knife, be applied, tied up in a fine Cloth, to the aking Tooth, yet after the use of some gentle Purgation.

10. It is a famous Medicine in Affects of the Eyes and Ears, drawing their Original from a *Catarrh*, provided the use of some Purging Medicine be not neglected.

11. This salt is egregiously useful, and especially after Metallick Bodies have been dissolved in it, against green Wounds of the Body and old *Fistula's*.

12. If it be mixed with a due quantity of common Water, and thence a Bath be made, it admirably clears away the *Scab* and like Affects of the skin, better than natural Baths themselves; for by its famous power of attracting depraved Humours, lying between the skin and flesh, and producing such Affects, it heals and extracts the same, especially if that power be helped by some other Medicine.

13. It extracts Humours of every kind, sharp, gnawing, or which are most firmly inherent in the external parts, or which often produce Vermin like Lice, and cannot be removed by Baths or Unguents.

14. This used interrally and externally (*viz.* in a Bath), extracts the Water out of Dropsical persons; and this it effects so much the more powerfully if Gold be dissolved in it.

15. It is a famous Medicine for removing Dolours of the Gout, or diminishing the same.

16. Inwardly given, it is conducent against bloody Fluxes of every kind.

17. Also externally applied, it wonderfully stops Blood in Wounds, especially if after it is calcined and reduced to Powder, it be mixed with Cobwebs or Peacocks Dung, or which is better, when Steel hath been dissolved in it.

18. It kills and expels all Worms.

19. In *Fractures of Bones*, and in *Ruptures*, it is a most excellent Medicament.

20. It, dissolved in Water, and

put upon the body, not only preserves Insects from Corruption, but also greater Animals, and Man; yet it may be used in a more dry form.

21. It is an excellent Conditure not only of Animals but also of Plants and Flowers.

22. It preserves bodies dissected from rottenness, stink, and dryness; contrary to what we have observed Turpentine, Spirit of Wine, Aloes and Myrrh to do; yea, from decay, as we have seen done in Salt-water.

23. It of Gold produceth an excellent *Elixir*, in a few daies, some granes of which used either liquid or dry, most gently expels depraved Humours by Urine, Sweat, and Seidge. Such a Universal *Arcanum* was never before this time known to Mortals; we liberally give it, for the Honour of GOD, and Health of our Neighbour.

24. It so prepareth Gold, as by the help of Alcolizate spirit of Wine, it passeth the Alembick of a golden colour, and is a famous Medicament.

25. Also by the help of that (although after another manner) a blue Tincture may be extracted from Gold, of excellent use in Medicine and Alchymy.

26. It is able to impress the nature of Vegetables on all Metals; so as Metals this way prepared, and added to the Roots of Herbs, impart to those Herbs the nature of the Metal applied. How famous the use of such Metallick Medicines will be in Medicine, it is easie to understand.

Of the Utilities of the Salt of Art, in various Arts

IT suddenly coagulates River-Water, Rain-Water, or any distilled Water, so as it becomes Ice, and may be carried in Paper, a Sack, or Wooden-Box or Chest, wheresoever you will, and be dissolved when need is, so as the salt may be separated from the Water; which salt is not at all changed by the Water, but may oftentimes again be used for like Coagulations.

2. After the same manner Wine, Vinegar, Beer, Metheglin, and like Drinks, may be reduced by coagulation into a clear substance, and again be most easily dissolved.

3. Also by help of that may be coagulated saline spirits, as, *Aqua-fortis*, *Aqua-regia*, spirit of Salt, spirit or oil of Vitriol, and the like, so as they will become hard salts, without any change or corruption, portable in Paper or Wooden Boxes, to other places, where being dis-

solved when need is, they exhibit a Liquor distinct from the salt, the salt in the mean while keeping its coagulating Virtues intire.

4. To Honey and Syrup it gives the consistency of sugar.

5. Fountains may be so stopped with it, as their flowing to be stayed.

6. It changeth wood in process of time into a most hard stone.

7. It abstracts the superfluous Phlegm from Wine, Beer, Vinegar, and spirit of Wine, its ungrateful taste or odour, and unto them also gives greater clearness.

10. Also it corrects the unsavory smell of Vessels, so as we may com-mo-diously use them.

11. It preserves for a long time all Fruits, as Cherries, Apples, Pears, Grapes, Garlick, yea, Hens-Eggs, and whatsoever may be changed by the air, and otherwise would be corrupted.

12. Unto *Painters* it may be a Basis for their *Colours*.

13. The seeds of Vegetables moistened in it, are wonderfully multiplied, so as from one only grane 10, 20, or 30 ears will arise: And the same will be effected, if the salt itself be committed to the earth.

14. It causeth the Earth long to keep the Rain-Waters it receiveth. Hence must necessarily arise great profit to the Fruits.

15. This applied to the Roots of Trees, recovers them, though almost dead before, and makes them fruitful.

16. Yea, Animals suffocated or drowned in Waters, as Dogs, Cats, Mice, and Insects, by help of it may again be restored to life.

17. It attracts the breathings of many men lying together in one Chamber, and coagulates the same as snow or ice; not indeed by any reall co-touching, but being included in some Glass, and hung up by a Thread. Even so, in a Magnetick manner have we observed such breath or vapour to adhere to the outside of Glass like true Ice. But this is a Winter operation.

18. Flowers and odoriferous Herbs, by addition of this, may be preserved without change of odour, taste, or colour.

19. By the benefit of this salt, various colours and very many odoriferous species may be prepared; whence the Roots of Plants, if they be applied to them, attract the colour or odour, which they communicate to the Herbs themselves.