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EFFERVESCENT SODIUM PERBORATE

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1 Claim. (Cl. 167-93)

This invention relates to effervescent salts and to methods of making the same and of treating materials therewith.

One object of the invention is to provide an improved gas liberating and gas propelling substance which may be applied to operate in situ; and a supplemental object of the invention is the provision of an improved mixture adapted to liberate nascent oxygen and a propellant gas for the oxygen or mixture, whereby the penetrability of the oxygen is uniformly substantially increased, and the resultant products are substantially neutral, so that treatment with the nascent oxygen may be had of relatively delicate fibers or materials, such as the flesh of a person's mouth.

More specifically, it is an object of the invention to provide a mixture of a perborate or the like and an effervescent substance, where the latter may include a mild acid and alkali, with an agent to prevent premature reaction or breaking up of the perborate and the mixture being in powdered form for convenient and instant application as desired.

Another object of the invention is to furnish a perborate or other oxygen liberating compound mixed with materials that are hygroscopic or otherwise tend to attract water vapor, such as essential oils, and an agent to prevent the compound mentioned from being affected by surrounding water vapor, so that the stability of the compound is maintained.

Another object of the invention is to provide an improved combined mouth wash and tooth powder, having scouring and oxygen liberating qualities, and nevertheless normally stable, and with the ingredients combined to serve the common purpose.

Another object of the invention is to provide an improved method of making a stable mixture as set forth, in a simple inexpensive manner.

Another object is to furnish a new method of applying nascent oxygen for rapid, convenient, inexpensive and efficient treatment over a relatively large surface, as may be desired.

Other objects and advantages of the invention will become apparent as the specification proceeds.

It will be understood that the different ingredients may be used in different proportions, and that some may be omitted or replaced by equivalents, and that the processes may be varied in regard to the nature and order of the steps employed, and that some steps may be omitted or

replaced by others that are substantially equivalent thereto.

Essential characteristics of the invention reside in greatly increased palatability, greater speed of gas liberation, and superior therapeutic qualities for the treatment of pyorrhea and gingivitis.

Referring in detail to the invention, the use of a perborate such as sodium perborate for liberating oxygen when in contact with water is well known. The sodium perborate has also been mixed with aromatic oils and other ingredients to improve the taste thereof. Even when enclosed in a suitably tight container, the perborate, if it stands too long, loses its strength by gradual disintegration. In any case, the liberation of oxygen thereby is comparatively weak and slow. Various attempts have been made to improve these conditions, but the provision of a cheap readily applied mixture which will obviate all the defects mentioned, and being in a form such as powder, has never been heretofore accomplished.

The invention may be best understood by reference to a specific example and the method of making and using the invention. The ingredients are preferably made up and mixed in groups as follows, and the groups thereafter combined in one mixture.

Group I		30
	Grams	
Sodium perborate.....	8	
Magnesium stearate.....	2	
Group II		35
(a)		
	Grams	
Magnesium stearate.....	4	
Aromatic or essential oils.....	0.9 to 1.0	40
(b)		
	Grams	
Add sodium bicarbonate.....	8	
Group III		45
	Grams	
Tartaric acid.....	7.6	
Colloidal clay.....	2	

The process of making the mixture is practiced in a reasonably dry atmosphere at ordinary or room temperature. All the ingredients powdered or granular, are free of water, except that the perborate and the acid may contain some water of crystallization. The tartaric or other acid that may be used is preferably granular or

as coarse as possible consistent with the fineness of the mixture. This could be removed only by heating, with consequent disintegration of the perborate. Group I is made by forcibly mixing or merely agitating or shaking together the perborate and the stearate in a suitable container. Group IIa is made by forcible mixing or rubbing together of the stearate and the aromatic oils until the mixture is uniform and wholly dry. In this manner the stearate absorbs or coats the oil particles so that the latter, being highly volatile and tending consequently to absorb moisture, are kept out of direct contact with the atmosphere. The sodium bicarbonate is then added and thoroughly agitated to produce a substantially uniform mixture of the stearate, bicarbonate and oils. By adding the bicarbonate last, any moisture or water vapor held by the oils cannot materially affect the bicarbonate. The third group is made by mixing or shaking together the tartaric acid and the colloidal clay.

There are now three separate groups of mixtures, of which the active ingredients have their particles coated with suitable buffer or separating materials, including the stearate and the kaolin. The first two are now mixed together by agitating or shaking, and thereafter the third group is intermixed therewith by agitating or shaking. Since the tartaric acid and the sodium bicarbonate tend to combine to neutralize each other and liberate a gas, it will be perceived that this is prevented by the interposition of a plurality of different inert or coating materials. Likewise the sodium perborate is similarly separated from the tartaric acid; so that any water contained by the latter is unavailable, to initiate a reaction between the bicarbonate and the acid. The significance in using two buffer materials, such as the stearate and the colloidal clay is that greater protection against water vapor is afforded, since the resistance or adhesion between dissimilar materials is greater than between similar materials. For the same reasons, the sodium perborate particles may, if desired, be coated with their individual material such as fuller's earth, or the like, in place of the sodium stearate.

It will be understood that the aromatic oils may be omitted, and are of importance mainly to improve the taste or odor of the preparation where the same is applied in the mouth of a person.

The proportions of the ingredients as above given may be readily varied by plus or minus 25-percent. Thus in the case of Group I, the 5½ grams to 10½ grams of sodium perborate may be mixed with 2 grams of magnesium stearate. Likewise 5 to 11 grams of sodium bicarbonate may be mixed with 4 grams of magnesium stearate. Similarly approximately 5 to 10 grams of tartaric acid may be mixed with 2 grams of colloidal clay. While the sodium perborate is approximately 25 percent of the complete mixture, it may be made to vary according to the ranges above given, and in any case between 10 and 50 percent, with desirable results, but may also be greater or less. The best results have been obtained with the proportions given in the table, according to the object of the invention of using the minimum amount of the buffer or separating material so as to permit the most rapid possible effervescent action, and yet employing sufficient of the material to reasonably maintain the stability of the preparation. It is noted that a heavier coating of the buffer is used on

the bicarbonate than on the perborate, as the former must be better protected from the acid. At the same time the clay used with the acid is a superior buffer to the stearate, and hence may be used in a lesser proportion.

Within the ranges above given, other materials may be substituted for those above mentioned, as follows: Instead of sodium perborate, calcium and other perborates may be used, or even sodium peroxide, although the latter is less desirable when the preparation is to be used in the mouth. Generally, any material which liberates oxygen when in contact with water may be used. In place of sodium bicarbonate, magnesium or other bicarbonates, carbonates, and in general any salt adapted to liberate a relatively inert or neutral gas such as carbon dioxide. As a substitute for tartaric acid, citric acid, succinic acid, and in general, all mild acids, such as fruit acids may be employed. Instead of magnesium stearate, one may use zinc stearate, zinc polymtate, zinc oleate, magnesium resinate or even magnesium carbonate or oxide, as the latter may be so used as to be very slow in action and hence substantially neutral. Furthermore, fatty acid salts, resinates, and arabates may be substitutes for the magnesium stearate. For colloidal clay, there can be substituted lycopodium, infusorial earth, fuller's earth, bentonite, and the like, it being understood that the range for the buffer or separating materials is very great, since they are inert and operate mainly in the physical sense.

It is noted that the bicarbonate is added to IIa, in preference to the fruit acid, since the latter loses moisture rapidly, and if some moisture should contact the oil, the latter would absorb and distribute the same. The fruit acid is the primary disturbing factor to be considered. On the other hand, the perborate and the bicarbonate are compatible and are comparatively easily handled.

It will be understood that magnesium stearate and colloidal clay, as well as their equivalents mentioned, may be interchangeably used with the other ingredients set forth. Thus the colloidal clay may be used in Groups I and II in substantially the same proportions in place of the magnesium stearate, and the latter used in Group III in place of the colloidal clay. With less satisfactory results, a single buffer material in the proportions mentioned may be used throughout, such as the stearate or the clay.

The combination of the stearate and the clay affords the most desirable buffer, because the use of the clay alone would render the preparation too heavy and retard the action and effervescence, while the use of the stearate alone would render the preparation so light in weight that it would be readily dissipated by any atmospheric disturbance. By employing both of these or suitable equivalents thereof, not only is a powder of the most desirable weight obtained, especially for use in the mouth, but the clay may form a gel with water and may operate as a cleansing or mild scouring agent whereby the preparation is capable of use both as a mouth wash and as a tooth powder. Moreover, the clay is superior to the stearate as a buffer.

The tartaric or citric acid may contain their water of crystallization, and being granular, effectively retain such water within themselves.

It will be noted that the bicarbonate and the acid are generally representative of any materials which will react to rapidly evolve a gas,

and preferably neutralize each other in so doing.

As hereinbefore stated, all ingredients are desirably as free as possible of water, and the buffer material is advantageously non-hygroscopic and insoluble in water.

A feature of the invention resides in the use of oil soluble dyes as a constituent of the aromatic oils, whereby the preparation is suitably colored, and will not color the mouth as would be the case if a water soluble dye were used. The liberation of nascent oxygen provides the preparation with a bleaching quality which can be utilized for various different purposes or in different arts.

If a perborate or the equivalent be used which has a greater amount of water of crystallization, or is more susceptible to the effects of moisture or vapor, the percentage of coating or buffer material may be increased as necessary, and likewise if effervescent salts be used which have a greater affinity for each other than those mentioned, the reverse is likewise true, but in general, all the various equivalents mentioned may be used in proportions within or throughout the ranges hereinbefore given.

The preparation is intended to be immediately packed in water proof preferably air tight containers, in which condition the preparation is stable for very long periods of time, as against prior preparations of the perborate in which the latter disintegrates comparatively rapidly even in a substantially airtight container.

In use, a quantity of the preparation is thickly spread as a powder on an object that is to be treated, as, for example, on the gums of the mouth, for which purpose a layer one-sixteenth to one-eighth of an inch thick is satisfactory. Upon contact with water or the saliva of the mouth, the perborate begins to liberate nascent oxygen and the bicarbonate and the acid react with each other so as to rapidly liberate carbon dioxide, the effervescence causing an agitation of the powder whereby the speed of liberation of the gases is further increased, and greatly

increasing the penetration of the nascent oxygen into the object that is being treated. In other words, the effervescent gas acts as a propellant for the nascent oxygen, being liberated in greater quantity and at higher velocity than the oxygen. A substantial area may thus be treated and the overlying powder envelopes and concentrates a considerable portion of the evolving gases. In applying the preparation to the gums of the mouth, the action described may be sufficient in itself to clean the gums and teeth. If desired, a person may use his finger to rub the powder over the teeth, a brush being unnecessary. Thereafter, the surface treated may be merely rinsed with water, and the treatment is completed. However, a quantity of the preparation may be placed in water and taken into the mouth to act as a mouth wash.

For the treatment of pyorrhea and gingivitis, the preparation must be applied to the gums in dry powder form and massaged vigorously over the gums. Such agitation together with the evolving of carbon dioxide breaks up the particles and renders the liberation of oxygen almost instantaneous. For the same reasons the penetrability of the oxygen and hence the therapeutic quality of the mixture are substantially improved. The unpalatability of sodium perborate, which is not wholly successively diminished by the use of flavoring agents alone, is substantially concealed by the liberated carbon dioxide gas.

When used with water, a few drops of water are successively placed on a quantity of the preparation to initiate the effervescence and then the preparation is taken into the mouth without further addition of water.

I claim:

A finely intermixed composition including sodium perborate, essential oils, and sodium bicarbonate, the particles of each having a coating of a stearate mixed with the essential oils, and tartaric acid the particles of which have a coating of colloidal clay.

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