

Effervescent Technologies
for
Multi-Sensory Bath and Shower Products

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Topics

- **Effervescent Basics**
 - Chemistry
 - Product Forms
 - Production Technology
- **Sensory Signals**
 - Olfactory
 - Visual
 - Tactile
 - Auditory
- **Multi-Sensory Product Ideas**



Effervescent Chemistry

General Reaction



Commonly Used Carbonate Salts

	Na_2CO_3	NaHCO_3
MW	106	84
Eq of Acid to Neutralize	2	1
% CO_2	41.5	52.4
Forms Available	High and Low Density Powders and Granules of Varying Particle Shapes	Fine to Coarse Powders and Granules
Cost (\$/lb)	0.05-0.15	0.20-0.30



Commonly Used Acids

	Citric	Fumaric	Adipic	Malic
MW	192.1	116.1	146.1	134.1
Moles of Acidity	3	2	2	2
Eq Weight	64.05	58.05	73.05	67.05
Solubility (%)	68.6	1.1	1.4	55.8
Cost (\$/lb)	0.85-1.25	0.90-1.00	1.25-1.35	0.95-1.05

Other Ingredients

- **Fragrances/Essential Oils**
- **Colors**
- **Functional Materials**
 - Botanicals
 - Emollients
 - Surfactants
 - Polymers
- **Binders**
- **Process Aids**



Production Methods

- **Direct Compression**
 - Dry materials blended and compressed directly
- **Wet Granulation/Compression**
 - Small amount of solvent added to dry materials during mixing
 - Solvent removed by drying and/or vacuum
- **Dry Molding**
 - Oils, oven drying used to bind effervescent materials
- **Wet Molding**
 - Solvent added to form moldable powder



Production Methods

	Direct Compression	Wet Granulation	Dry Molding	Wet Molding
Cost	Lowest	Low	High	High
Density	High	High	Low	Lowest
Effervescence Time	Slow	Slow	Fast	Fastest
Stability	Moisture proof wrap and/or desiccant required	Moisture proof wrap and/or desiccant required	Relatively stable to ambient humidity	Relatively stable to ambient humidity



Product Forms

- **Tablets/Marbles**
- **Molded Shapes**
- **Granules**
- **Powders**



Product Manufacturing Methods

	Powder Mixing	Direct Compression	Wet Granulation	Dry Molding	Wet Molding
Tablets/Marbles		X	X		
Molded Shapes				X	X
Granules		X	X		
Powders	X				



Sensory Stimuli

- **Olfactory**
- **Visual**
- **Tactile**
- **Auditory**



Olfactory Stimuli

- Important Point-of-Purchase Impression
 - Fragrance Reference on Label/in Product Name
 - Customer Testing/Sampling
- In and After Use Performance
 - Water Fragrance
 - Room Aroma
 - Skin Scent
 - Aromatherapy



Olfactory Performance by Product Form

Form	Performance
Tablets/Marbles	<ul style="list-style-type: none">▪ High Density-Effervesce at Bottom of Tub▪ Slow Release of Fragrance
Molded Products	<ul style="list-style-type: none">▪ Low Density-Effervesce on Water Surface▪ Rapid Fragrance Release
Granules	<ul style="list-style-type: none">▪ High Density, Small Particle Size Releases Fragrance Quickly while Product Sinks
Powders	<ul style="list-style-type: none">▪ Low Density, Small Particle Size Flashes Fragrance at Water's Surface

Exothermic-Effervescent Technology to Improve Olfactory Stimulation

- Combination of Effervescent and Exothermic Reactions Synergistically Boost Fragrance Lift

Formula	1	2	3	4
Acid	X	X		X
Carbonate	X	X	X	
Exothermic Material	X		X	X
Temp Rise	29°C	-5°C	19°C	9°C
Dissolution Time	6:57	10:03	29:45	40:32
Fragrance Lift	Very Good	Poor	Poor	Poor

- Best Executions in Tableted Products
- Creates Opportunities for Shower and Room Products
- US Patent 5,993,854



Foaming-Floating Technology to Improve Olfactory Stimulation

- Surfactants Carry Fragrance Oils to Water Surface
- Foam Creates Surface Area for Fragrance Evaporation
- Low Density, High Reaction Rate Molded Products Create Excellent Foam

Process	Density (g/cc)	Dissolution Rate (g/sec)	Foam Acceptability
Molding	0.90	>1.0	Excellent
Tableting	1.43	<0.5	Fair

- US Patent 6,121,215





Visual Stimuli

- Important Point-of-Purchase Impression
 - Product Appearance
 - Shape
 - Color
 - Texture
 - Package Appearance
- In Use Performance
 - Changing Water Color
 - Degree of Turbulence
 - Foam
 - Lingering Color Specks



Improving Visual Stimulation

- Product
 - Multiple Colors/Variegated Appearance
 - Soluble Glitter
 - Botanicals, Herbs, and Flowers
 - Shape
- In Use
 - Foam
 - Reactivity/Turbulence
 - Soluble Glitter



Product Shapes, Colors and Forms



Tactile Stimuli

- Water Effects
 - Foam
 - Emolliency/Slip
 - Fizzing Massage Feeling
- Skin Effects
 - Emolliency
 - Tingling



Improving Tactile Stimulation

- In-Water Effects
 - High Reactivity Effervescent Systems
 - Foam
 - Emollients, Humectants, Polymers
 - Tinglers (e.g. Menthol)
- Skin Effects
 - Emollients, Polymers
 - Vasodilators



Auditory Stimuli

- Fizz Sound
 - Reactivity of Effervescent System
- Crackling Sound
 - Encapsulated Carbonation





Multi-Sensory Effervescent Product Ideas

Treatment Products

- Skin treatment bath ball with soothing botanical extracts and skin conditioners
- Cold therapy bath ball with eucalyptus oil
- Foot soak marbles with menthol for cooling/tingling sensation
- Nail soak tablet with soothing botanical extracts and conditioning oils



Multi-Sensory Effervescent Product Ideas

Luxury/Pampering/Prestige Products

- Foaming bath ball with soluble glitter
- Milk treatment bath ball

Aromatherapy Products

- Exothermic fragrance tablet for shower use
- Exothermic fragrance tablet for use in kitchen sink
- Marbles or granules for table-top room use
- Fragrance tablets for use in room humidifiers



Multi-Sensory Effervescent Product Ideas

Teen Products

- Crackling bath oil
- Foaming bath ball with glitter

Kids' Products

- Crackling bath product that adds vivid color to the bath water
- Crackling powder or gel hand cleanser
- Foaming bath ball with concealed toy that is released during use

