The Leela Corporation

SODIUM SILICATE

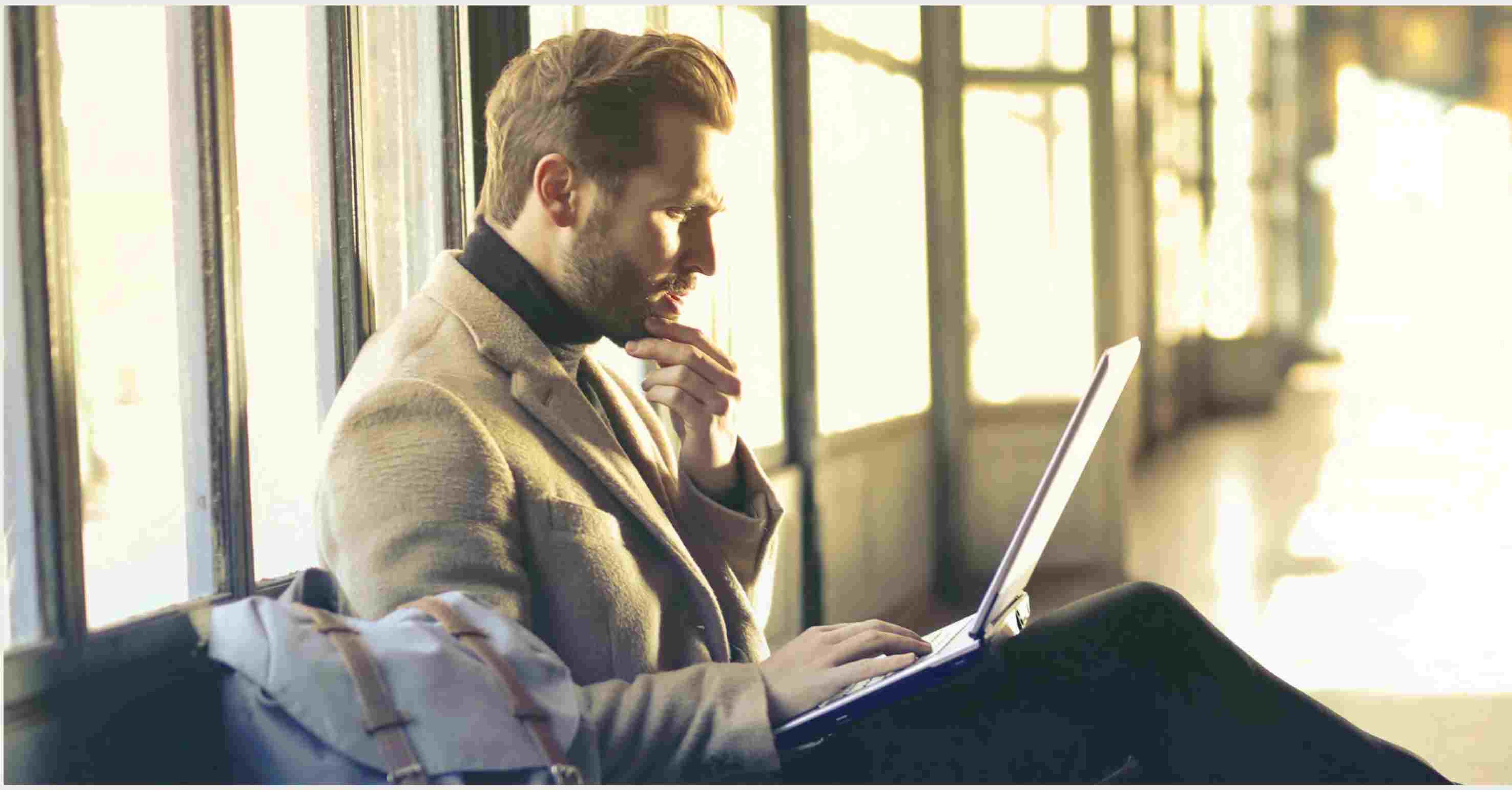
Liquids & Solids

DIVISION OF INDUSTRIAL CHEMICAL

About Company

The Leela Corporation, founded in 2015, is a leading manufacturer of a sodium silicate and diverse range of chemicals, polymers, dyes, pigments, intermediates, and is in to hazardous waste management services with its headquarters in Ahmedabad (Gujarat, India). With the assistance of our channel partners, we are able to deliver these products in various specifications within the stipulated time frame.

The Leela Corporation is a conglomerate, one of the fastest emerging companies certified by an ISO 9001:2015 & ISO 14001:2015 and manufacturers and exporters of sodium silicate, acrylic based specialty Polymers in India. Currently, TLC is a multi-product group with proven capabilities in design, development, manufacturing, and servicing various chemicals and related products for all of the aforementioned industries. TLC has been a facilitator of solutions to industry-specific issues and requirements.

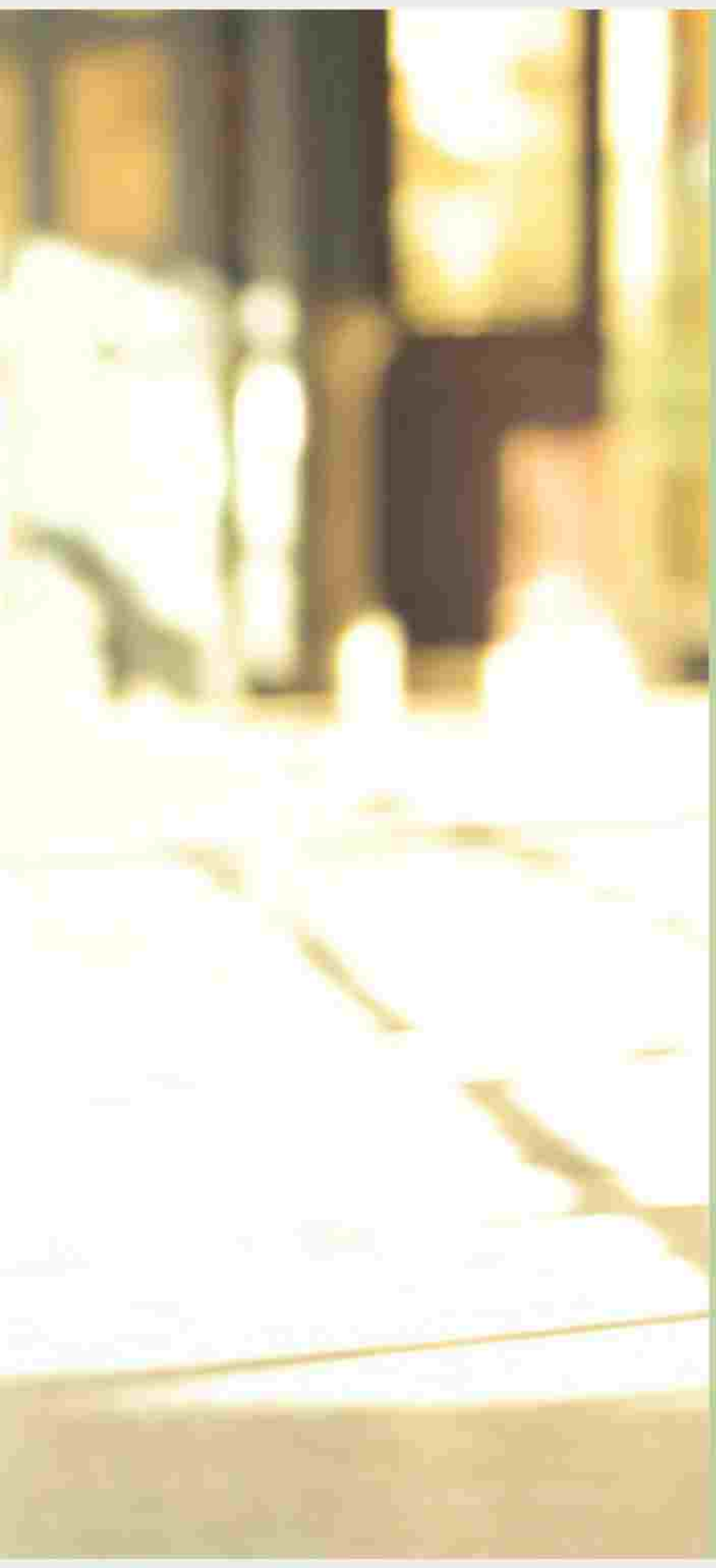


Vision

The Leela Corporation dedicates itself to offering cutting edge qualitative sodium silicate. The company shall strive to be the global leader in the segments by focusing on R & D of silicate chemistry.

Mission

Our mission is to use science to benefit society and to provide unrivalled service to the chemical industry while maintaining a trustworthy reputation through the use of safe and healthy procedures. We carry out our work in accordance with local, national, and international regulations, and we respond to market demands and standards by promoting environmentally friendly business practices.



Soluble Silicates

Sodium Silicates - Solutions

- Available in a variety of weight ratios and viscosities.

Sodium Silicates - Solids

- Available in a variety of weight ratios and particle size distributions.

Improving the Science of Silicate Chemistry

TLC acquired its status as the industry leader in silicate chemistry over the years by pioneering numerous industry advancements, high-value speciality silicate derivatives such as zeolite-based catalysts. TLC is one of the producer and exporter of soluble silicates.

TLC innovation extends beyond its own goods. In applications as diverse as speciality concrete, dry-blended detergents, acid-resistant enamelware and glazes, dry paint mixes, and corrosion inhibitors, we are continually searching for innovative methods to improve your operations and the quality of your goods. In fact, whenever you construct a home, launder your clothes, or consume water, you are probably reaping the benefits of silicate chemistry.

The success of our firm is as essential to us as our own. Consequently, we maintain our dedication to continual quality improvement, outstanding goods, and knowledgeable technical assistance.

TLC is the silicate producer with global reach. Our customer service team provide assistance from the laboratory to the factory. Therefore, regardless of your location, TLC is prepared to meet your global sodium silicate requirements.

Supplying Quality Sodium Silicates to the World

TLC offers the most comprehensive selection of sodium silicate products in the industry, including liquids of various alkalinity and viscosity, hydrated and anhydrous powders, and solid glass lumps.

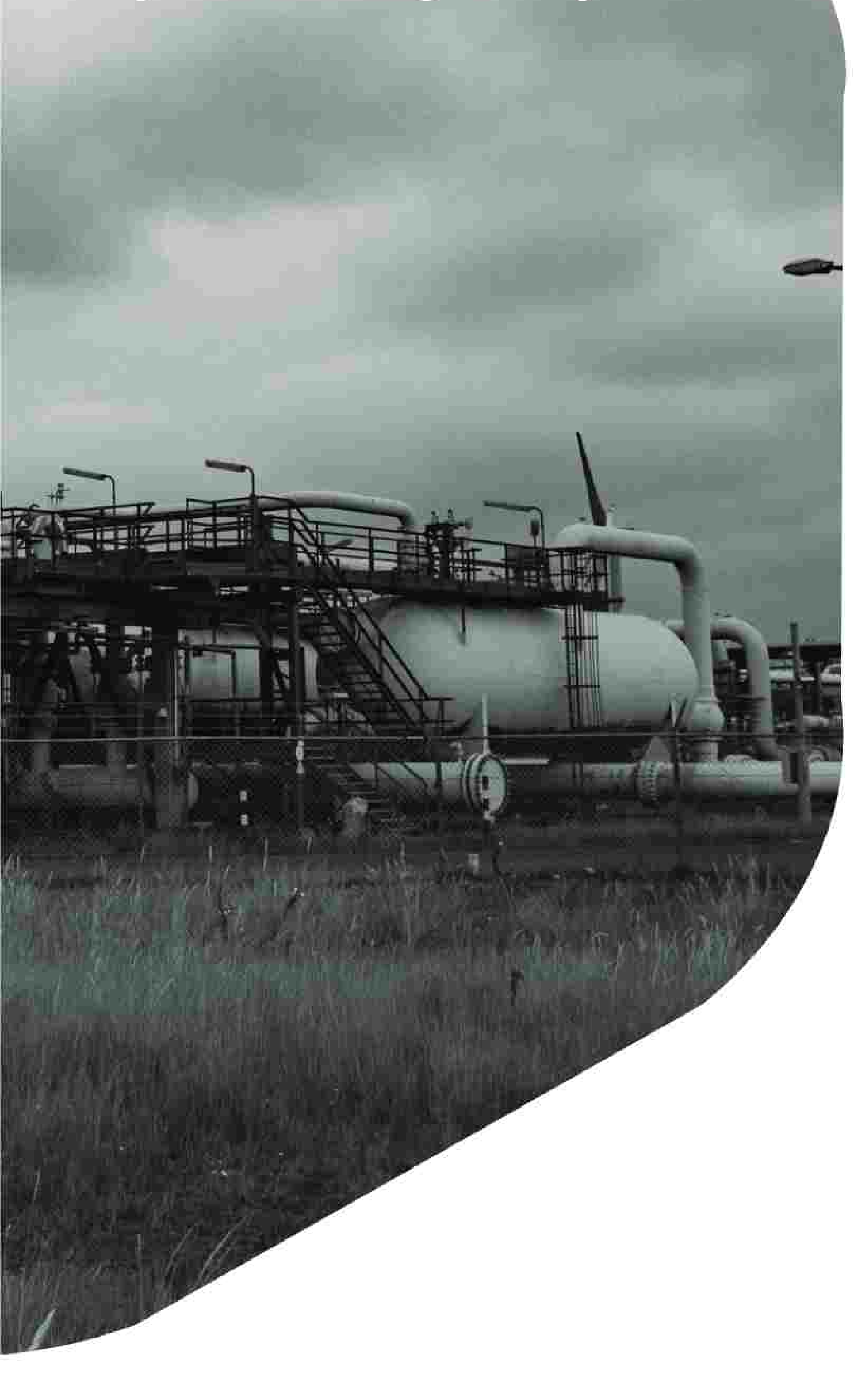
TLC is in a unique position to assist our global customers in achieving success due to its comprehensive expertise of silicate chemistry. We will assist you in locating the optimal product for your application. Whether your application is conventional or novel, our chemists, engineers, and account managers will collaborate with you from bench-scale development to full-scale production, including storage, handling, and maintenance support.In fact, whenever you construct a home, launder your clothes, or consume water, you are probably reaping the benefits of silicate chemistry.

Building Better Detergents

As detergent enhancers in spray-dried, agglomerated, or dry-blended formulations, Sodium silicate offer the following properties:

Wetting. Reduce the surface tension of liquids with sodium silicates to increase soil removal.

Emulsification. Our silicates disperse greasy soil into fine droplets suspended in the washing solution, preventing the particles from recombining.



Deflocculation. Sodium silicate aid in the fragmentation of inorganic or particulate soils, making them simpler to remove from surfaces and suspend in solutions.

Preventing the redeposition of dirt Sodium silicates prevent suspended dirt from reattaching to surfaces that have been cleansed.

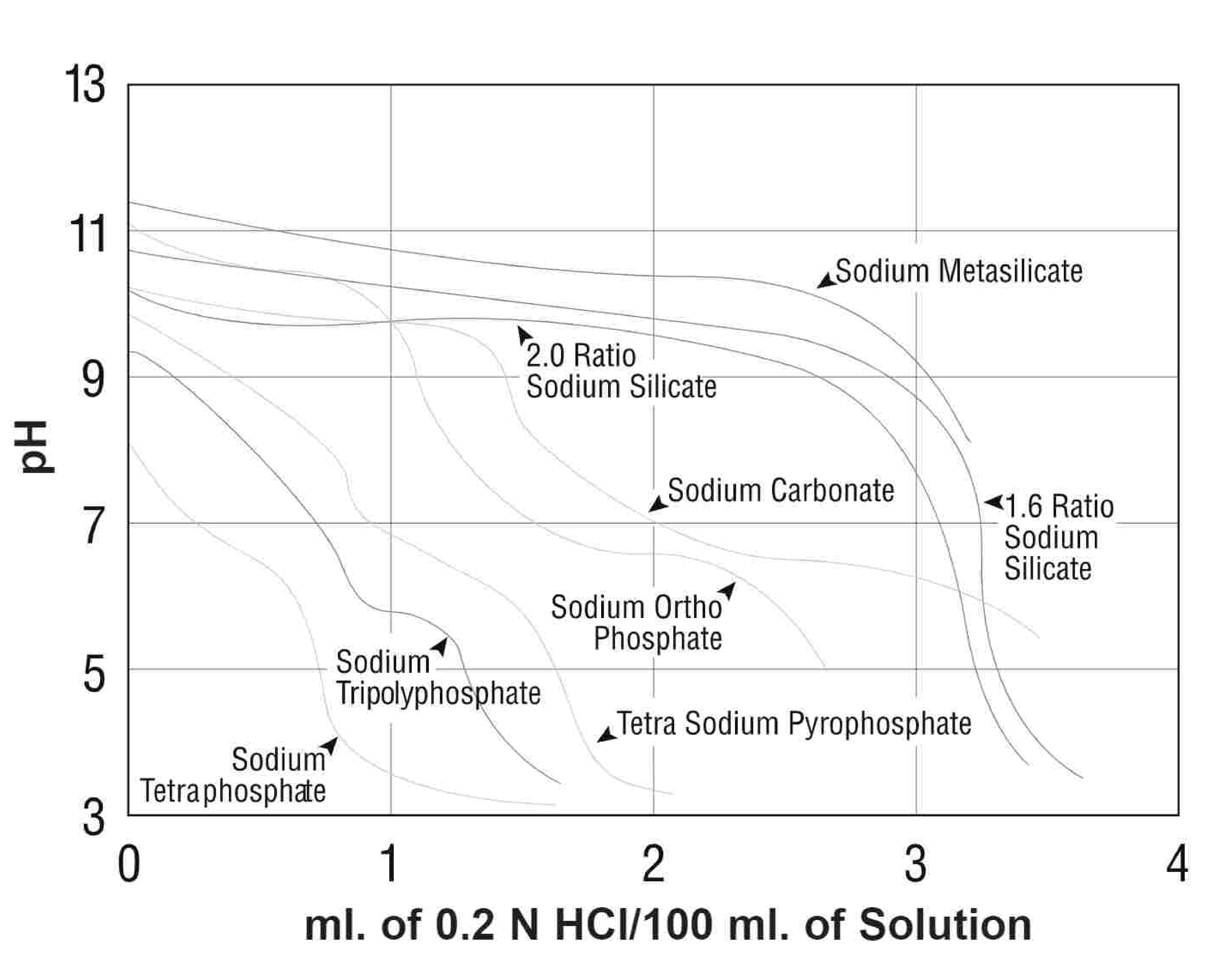
Alkalinity and buffering capacity. Sodium silicates can neutralise acidic soils, emulsify fats and oils, and disperse or dissolve proteins due to their alkalinity. Their buffering capacity, which is greater than that of the majority of alkaline salts, maintains the correct pH in the presence of acidic chemicals or after dilution.

A comprehensive chart of typical applications for TLC sodium silicates is available on page 10.

In Figure 1, the exceptional buffering capacity of sodium silicate is compared to that of other alkalis routinely employed in detergent compositions.

Figure 1

Buffering Capacity of Various Alkali Solutions at 0.02% Na_2O Concentration



Corrosion prevention The polysilicate ion forms a physical barrier to prevent alkali attack and protect delicate glazed dishware, glass, and metallic surfaces, such as metal buttons, zippers, and washing machine parts.

Stabilization. In the cleaning cycle, sodium silicates stabilise chlorine and oxygen bleaches.

Phosphate substitution. Widespread use of sodium silicates as a partial phosphate replacement in phosphate-free formulations. They can also be used with synthetic zeolites to totally replace phosphates while preserving detergency.

Aid in processing. In the production of spray-dried detergent powders, silicate solutions are added to the detergent slurry to aid maintain the right viscosity for creating the necessary density of powder. They also serve as a binder to impart the proper degree of crispness to detergent beads without affecting the solubility of the powder in water. Additionally, proper dosages of silicate reduce the number of undersized particles or fines produced. The benefits of sodium silicates in agglomerated and dry-blended goods are identical.

Dye Bleaching

Widespread use of hydrogen peroxide in the bleaching of ground wood pulps. It is also gaining use in the bleaching of Kraft wood, where it helps reduce chlorine demand and environmental impact. sodium silicates are an essential ingredient in hydrogen peroxide bleach liquors. Iron, copper, and manganese, which catalyse the decomposition of hydrogen peroxide, are deactivated by these compounds. In addition, silicates act as a pH buffer to maintain the bleach liquid at the optimal peroxide concentration.

Paper Destruction for Recycling

Sodium silicates are essential components in formulations for deinking waste paper. They aid in the removal of inks from paper fibres and in their suspension and dispersion, preventing the ink particles from redepositing on the fibres. Silicates also add alkalinity, allowing the process to operate at a lower pH than would be conceivable if caustic soda were used alone. Deinking at a lower pH reduces alkali darkening, which is typically an issue with mechanical pulps. Additionally, silicates stabilise hydrogen peroxide, which may be included in the deinking formulation. Silicates are effective with a variety of inks and materials, including newsprint, coloured or varnished magazine stock, and rotogravure stocks.

Purified Water

Activated silica sol is a cost-effective and economical coagulant for industrial and municipal water treatment. Activated silica, when combined with alum, ferric salts, and other main coagulants, accelerates floc formation and increases floc size, density, and stability. Activated silica facilitates more effective coagulation at low temperatures and can also be used as a filter aid. Many companies get a clear effluent by entangling finely separated pollutants in rapidly developing floc using activated silica. Sedimentation and/or filtering is utilised to separate floc from water.

Safer Drinking Water

Sodium silicate solution is reducing lead, copper, and other heavy metals in drinking water. As a corrosion inhibitor, they generate a tiny layer on the interior of water supply pipes, preventing the leaching of lead solders and other metals throughout the system. In contrast to other corrosion inhibitors, sodium silicate does not introduce phosphate or zinc into the water supply.

In addition, sodium silicates have a favourable influence on pH compared to phosphate-based corrosion inhibitors. Sodium silicate, when added in the right amount, can elevate system pH into the alkaline range — another recommended method for reducing lead levels in municipal water systems. Acidic (pH 7) and extremely soft water tends to dissolve more lead than water in the pH range of 8 to 10, which sodium silicate can assist preserve.

Small amounts of silicate can be added to water supplies with high levels of iron or manganese to prevent "red water" discoloration.

Better Textiles

Sodium silicates from Better Textiles TLC are utilised in numerous textile mill applications:

Bleaching. They deactivate metals that catalyse hydrogen peroxide's breakdown. In addition, they buffer the pH to the optimal level for peroxide bleaching.

Fabric and yarn pre-treatment. On cotton, silicates are used to remove wax, oil, and particles. Selecting the appropriate silicate ratio and solids enables superior cleaning and prevents soil redeposition.

Pad-batch dyeing techniques These techniques are favoured over others because they utilise less water, display superior dye adhesion, can be operated at lower temperatures, and have batch-to-batch consistency. Sodium silicate can neutralise the pH of the dye liquor and remove impediments to dye bonding, such as oils and grime.

Agricultural Applications

Silica that is soluble is an essential component for plant health and vigour. Very low doses of TLC-soluble silicates can help plants withstand illness and enhance output. Potassium silicates are more typically employed in this application, while sodium silicates are an effective and inexpensive alternative.

Adhesives with Retention

For non-plastic materials such as paper, wood, metal, and foil, sodium silicate adhesives offer various benefits:

- Effective dispersion and penetrability
- Effective bond formation
- Controllable set-rates over extensive limitations.
- A strong, stiff adhesive that resists heat and water to a moderate degree.

Due to their high polymeric silica content, silicates with weight ratios between 2.80 and 3.20 are extremely helpful as adhesives and binders. These substances are transformed from liquid to solid by removing minute amounts of water. In many applications, silicates are a low-cost alternative to latex (e.g., PVA) adhesives and dextrin. Sodium silicate for adhesives are provided in a ready-to-use state, but they can be modified with clay, casein, and organic additives for specialised uses.

Strong Bonding Cement

Sodium silicate are essential to the production of air-setting refractory specialities and chemical-resistant mortars. Cements composed of soluble silicate binders are resistant to high temperatures, acids, slumping, and re-dissolution after setting. Sodium silicate are also utilised to alter the physical properties of hydraulic products like portland cement. The addition of silicate to cement can lower permeability by increasing the number of aggregate particle links. Additionally, silicates can be utilised to adjust the setting time in cold or harsh conditions.

More Durable Concrete

TLC's sodium silicate can be put on the surface of hardened concrete to strengthen its resistance to abrasion, water, oil, and acid. Lime and other components slowly react with silicate solution to generate an insoluble gel within the pores of concrete.

Economical and Ecologically Sound Foundry Binders

Sodium silicate are widely recognised as eco-friendly foundry sand binders. Because sodium silicate inorganic binder systems are non-toxic, emit almost no fumes, are odourless, and are simple to use, they contribute to cleaner foundry conditions.

The reaction of sodium silicate binders with CO2 gas or with other acid-producing chemicals, such as aliphatic organic esters, sets the binders. The only source of fumes in these processes are the extremely small amounts of ester catalysts and additives used to increase shakeout and humidity resistance. Reclamation of silicate-bound sands is a common occurrence. Low levels of residual organics make disposal of used sands from sodium silicate castings simpler and cheaper.

Superior Ore Beneficiation

Sodium silicate are utilised in a variety of mining and mineral processing systems to enhance the recovery of valuable minerals while reducing contamination. Their primary function in ore flotation is as a deflocculant to break up undesirable clay. Additionally, sodium silicates prevent the corrosive wear of grinding medium. Sodium silicate assist in increasing process output and decreasing overall operating expenses.

Agglomerating, Pelletizing, and Briquetting

Sodium silicate is utilised in various applications due to its inherent adhesive characteristics, rapid setting, and cost-effectiveness.

Agglomeration. The agglomeration of mined, processed, and recovered materials into fine granules eliminates dust and improves heat processing in drying, calcining, and fire activities. Eliminating dust decreases air and water pollution as well as kiln ring accumulation. Additionally, agglomerating dusty materials increases their transport and storage properties.

Pelletizing. Green pellets is the name of a method in which fine material is moulded into moist balls. The addition of silicate to the material facilitates balling and boosts the pellets' strength in both the dry and burned states.

Briquette formation, tableting, and extrusion. These methods utilise sodium silicate as a lubricant or binder to enhance the fluidity or cohesion of the materials.

Thinner Clay Processing Slurries

In the preparation of raw clay and other mineral slurries, TLC 's sodium silicate is employed as a deflocculant. Silicates lessen the viscosity of slurry, making it easier to pump and process. This aids in the elimination of pollutants and reduces energy expenses. Additionally, silicate functions as a buffer for any alkali present, which may further minimise processing expenses.

Sodium silicate is also utilised in slip casting with clay. Reduced viscosity increases casting times. Because less water is required, firing periods are shortened and the end product is more durable and shrinks less.

A Strong Basis for Chemical Grouting

Soil stabilisation, often known as chemical grouting, involves combining sodium silicate with one or more chemicals that react with the silicate to form a groutgel bond. In the Joosten method, for instance, sodium silicate and calcium chloride are injected individually into the soil to generate an immediate grout. Other reactants are predominantly organic. Chemical grouting can be utilised in a variety of circumstances:

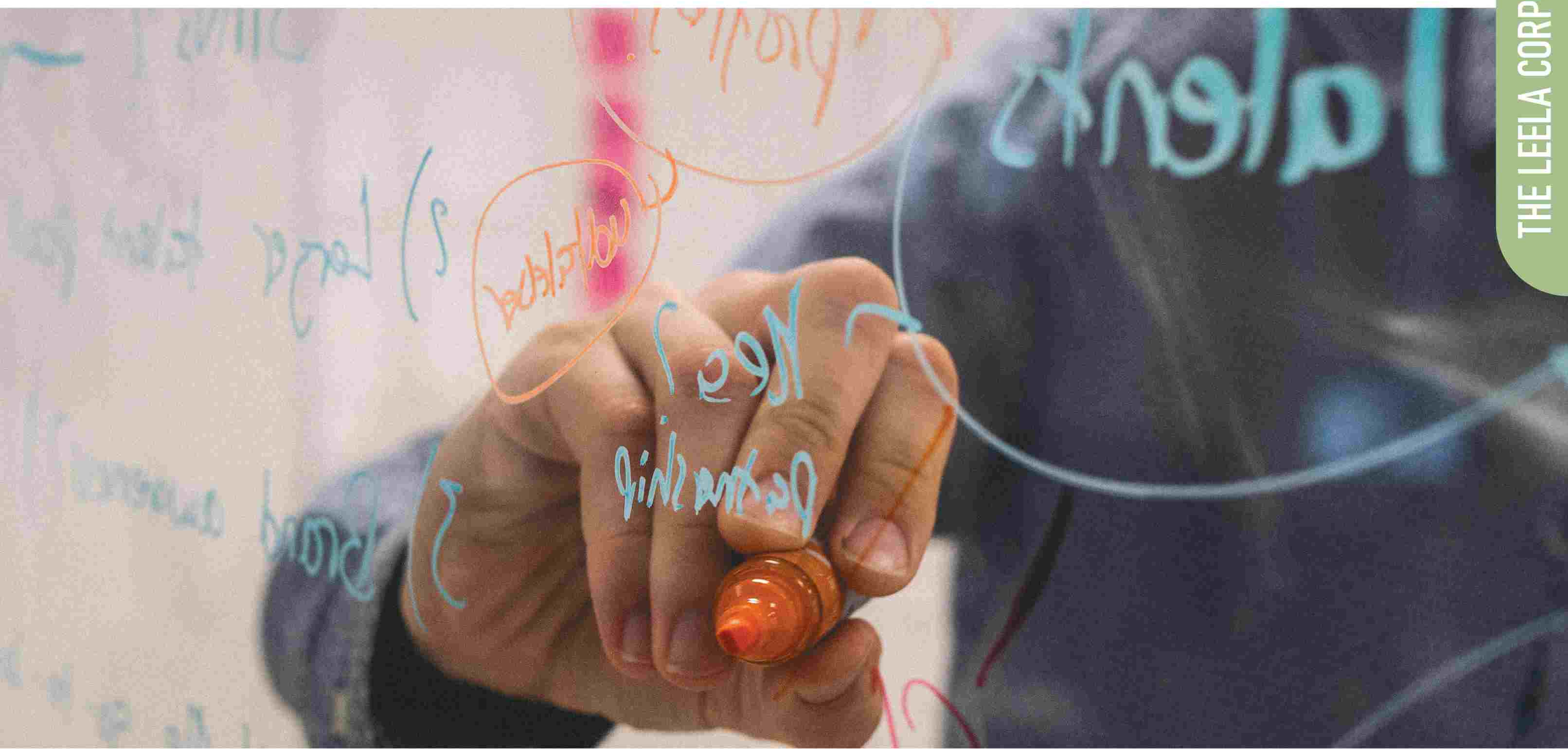
- To reinforce soil formations that are insufficiently robust to support the requisite load, such as foundation walls and footings.

- To make impermeable the porous soils that would otherwise allow mines, shafts, and tunnels to flood.

- To limit water loss through dams and other containment systems with fractures.

- To seal permeable brickwork or concrete in sewers, subway construction, and dams.

- To encapsulate soils polluted with hazardous substances and restrict the migration of toxic components into groundwater.



Typical Applications of TLC Sodium Silicates

Industry & Typical Applications	Silicate Function	Principal Benefit
Detergent/Cleaning Compounds		
Household Laundry Powders	Binder, corrosion inhibitor, deflocculant	Processing aid for spray-dried and agglomerated products. Corrosion protection. Detergency.
Liquid Detergents and Cleaners	Deflocculant, buffer	Detergency. Corrosion protection. Corrosion inhibition.
Pulp and Paper		
Peroxide Bleaching of Pulp	Chemical reaction	Conserves peroxide. Produces whiter pulp.
Deinking	Detergency	Ink removal.
Raw Water Treatment	Flocculation	Clearer effluent.
Head Box Additive	Flocculation	Retains fines and fillers on the wire.
Coating	Film formation	Grease-proofs. Moisture resistant.
Adhesives for Laminating/Labeling	Adhesion	Economical. Strong bonds.
White Water Treatment	Flocculation	Increases size of floc. Improves clarification.
Paper Board		
Spiral-Wound Tubes	Adhesion	Adds rigidity. Economical.
Fiber Drums	Adhesion	Adds rigidity. Economical.
Water Treatment		
Lead and Copper Control	Chemical reaction	Reduces levels of toxic metals.
Raw and Wastewater Treatment	Flocculant	Increases size and speeds formation of floc.
Water Line Corrosion Prevention	Film formation	Protective film inhibits corrosive attack on metal.
Iron and Manganese Stabilization	Chemical reaction	Improves taste. Eliminates "red water."
Building Products/Construction		
Hardening Concrete	Chemical reaction, sealant	Hardens. Acid resistant.
Acid-Proof Cements	Binder	Ease of use. Economical.
Refractory Cements	Binder	Strong bond. Excellent refractory & acid resistance.
Thermal Insulation	Adhesion, film formation	Fireproof bond.
Soil Solidification/Grouting	Gel reaction	Economical binder.
Textiles		
Peroxide Bleaching	Chemical reaction	Conserves peroxide. Whiter whites.
Pad-Batch Dyeing	Buffering	Dye fixation. Lower processing costs.
Ceramics		
Refractory Cements	Binder	Air set, green strength.
Slip Casting	Deflocculant	High solids.
Slurry Thinners	Deflocculant	Reduces water.
Clay Refining	Deflocculant	Improves fluidity.
Petroleum Processing		
Drilling Muds	Chemical reaction	Controls heaving shale.
Corrosion Prevention	Chemical reaction	Efficient. Economical.
Emulsion Breaking	Chemical reaction	Breaks emulsion.
Metals		
Porous Castings	Impregnation	Seals leaks. Fills voids.
Coating Welding Rods	Binder	Good bond and fluxing action.
Ore Beneficiation	Deflocculant	Separation aid. Corrosion control.
Foundry Molds and Core Binders	Binder	High strength. Eliminates fumes.
Smelting Dusts	Agglomeration	Eliminates dust. Improves environmental conditions.
Pelletizing	Binder	Aids balling. Increases strength of formed pellets.
Briquetting	Binder	Improves flow characteristics & cohesive properties.

Properties of Liquid and Solid Sodium Silicates

TLC manufactures sodium silicates with a variety of properties to fulfil a variety of application requirements. This section provides a concise summary of the principal properties of Sodium silicate.

Ratio

Sodium silicate glass composition can be denoted as: Na2 O · (SiO2) x – where x is the component ratio and lies between 0.4 and 4.0.

Since a molecule of Na2O and a molecule of SiO2 weigh roughly the same, the molecular and weight ratios are almost same. In the india, silica-to-alkali weight ratios are commonly utilised for sodium silicates that are more siliceous than metasilicates (which have a 1:1 mole ratio). It is essential to define both the weight ratio of silica to alkali and the concentration of the sodium silicate needed.

TLC provides liquid sodium silicates with weight ratios between 3.25 and 1.60 and densities between 35°Bé and 59°Bé at 20°C (Table 2). TLC solid anhydrous silicates have ratios ranging from 2.00 to 3.22. (Table 3).

Table 2

TLC Sodium Silicate Solutions

Wt. Ratio SiO_2/Na_2O	Density at 68˚F (20˚C)						Viscosity centipoise	Characteristics
	$\%Na_2O$	$\%SiO_2$	˚Bé	lb/gal	g/cm^3	pH		
3.25	9.22	30.0	42.7	11.8	1.42	11.3	830	Syrupy liquid
3.22	8.90	28.7	41.0	11.6	1.39	11.3	180	Syrupy liquid
3.22	8.60	27.7	40.0	11.5	1.38	11.3	100	Specially clarified
3.22	9.15	29.5	42.2	11.8	1.41	11.3	400	More concentrated than N®
2.88	11.00	31.7	47.0	12.3	1.48	11.5	960	Sticky, heavy silicate
2.58	12.45	32.1	49.3	12.6	1.52	11.8	780	Syrupy liquid
2.50	10.60	26.5	42.0	11.7	1.41	11.9	60	Brilliantly clear, stable solution
2.40	13.85	33.2	52.0	13.0	1.56	12.0	2,100	Heavy syrup
2.00	14.70	29.4	50.5	12.8	1.53	12.7	400	Syrupy, alkaline liquid
1.60	16.35	26.2	50.3	12.8	1.53	13.4	280	High alkalinity, syrupy liquid

Table 3

Solid Form TLC Sodium Silicates

Wt. Ratio SiO_2/Na_2O	Approximate Density					Particle Size Characteristics (Tyler Screen)
	$\%Na_2O$	$\%SiO_2$	$\%H_2O$	lb/gal	g/cm^3	
3.22	23.50	75.7	0	88	1.40	Coarse lumps
2.00	33.00	66.0	0	88	1.41	Coarse lumps

Density

The density of silicates is measured in degrees Baumé (°Bé), which can be translated to specific gravity as follows:

$$\text{Specific Gravity} = \frac{145}{145 - \text{degrees Baumé}}$$

The link between specific gravity and degrees Baumé is displayed in Table 4. At 20°C, we measure density with narrow-range hydrometers made specifically for this purpose. As seen in Table 5, silicate density reduces as temperature increases. As illustrated in Figure 2 for selected Sodium silicate, density increases linearly with solids concentration.

Table 4

Density (˚Bé) and Specific Gravity Equivalents

Degrees Baumé	Specific Gravity	Degrees Baumé	Specific Gravity
35.0	1.3182	48.0	1.4948
36.0	1.3303	49.0	1.5104
37.0	1.3426	50.0	1.5268
38.0	1.3551	51.0	1.5426
39.0	1.3679	52.0	1.5591
40.0	1.3810	53.0	1.5761
41.0	1.3942	54.0	1.5934
42.0	1.4078	55.0	1.6111
43.0	1.4216	56.0	1.6292
44.0	1.4356	57.0	1.6477
45.0	1.4500	58.0	1.6667
46.0	1.4646	59.0	1.6860
47.0	1.4796	60.0	1.7059

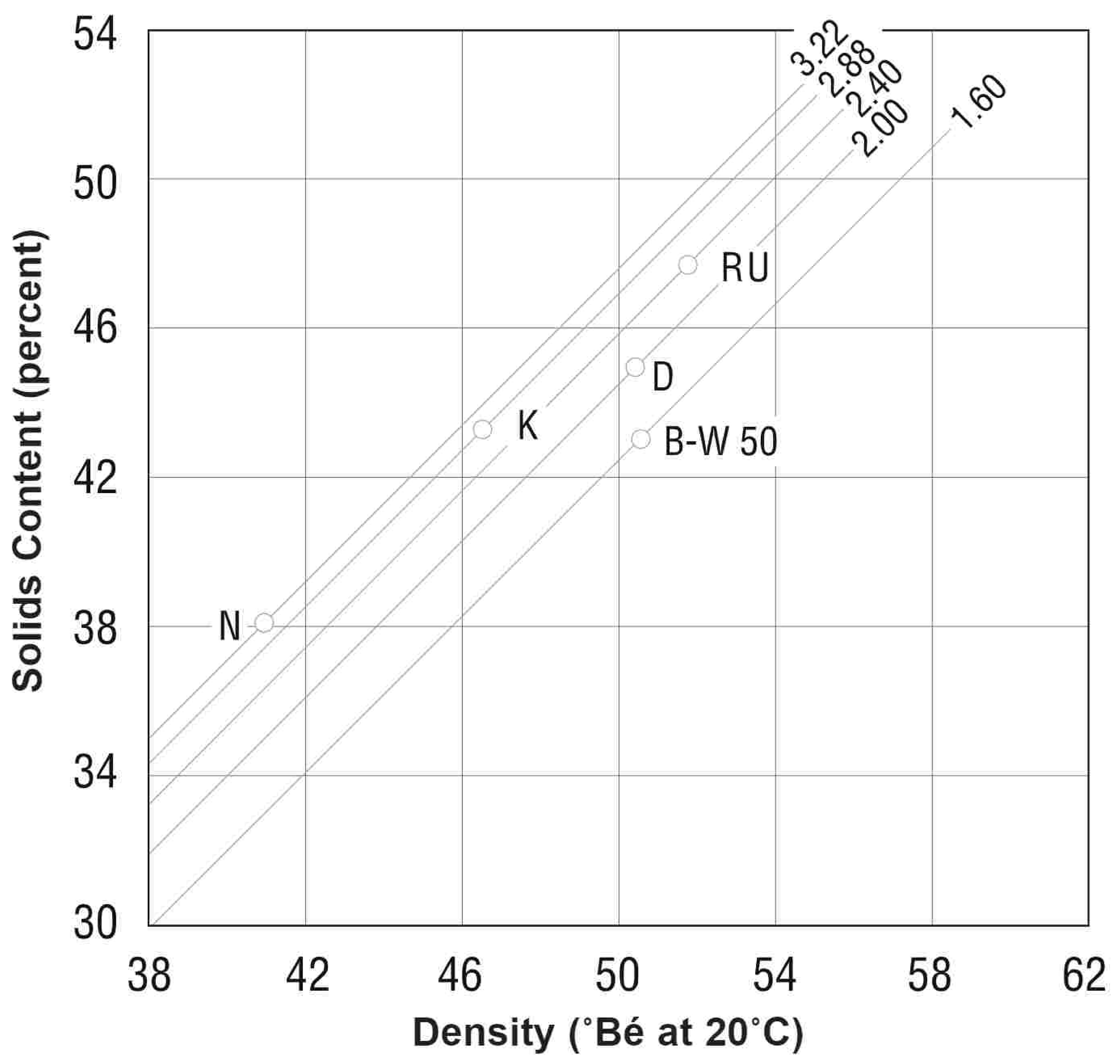
Table 5

Densities of Selected TLC Silicates at Various Temperatures

Temperature (˚C)	N® Density (˚Bé)	O® Density (˚Bé)	STAR® Density (˚Bé)	RU® Density (˚Bé)
10	41.5	42.6	42.4	52.3
21	41.0	42.2	42.0	52.0
32	40.6	41.7	41.5	51.7
38	40.3	41.4	41.3	51.3
49	39.9	41.0	40.8	51.0
60	39.4	40.5	40.4	50.6

Figure 2

Densities of Sodium Silicate Solutions as a Function of Solids Content

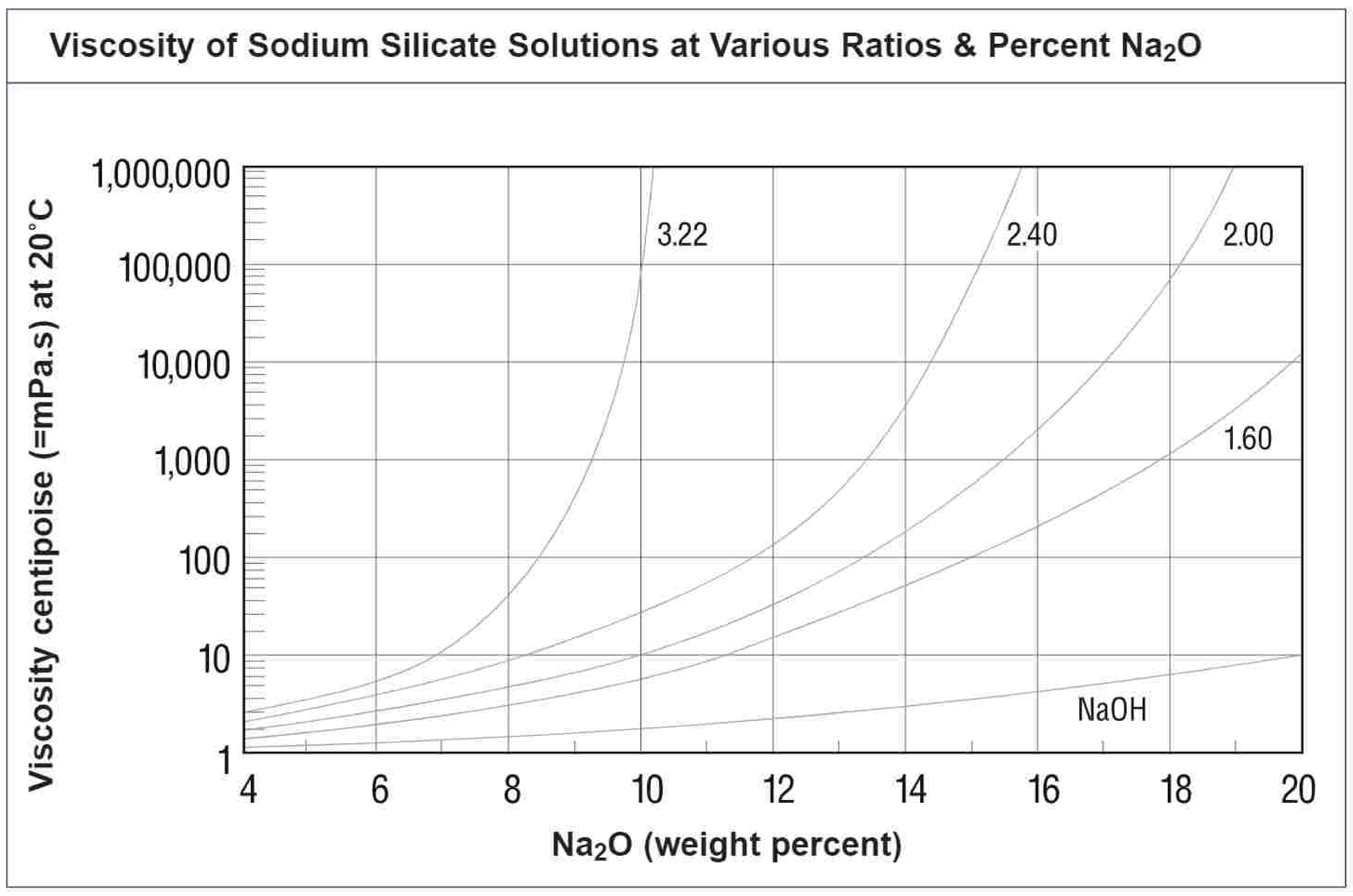


Viscosity

The viscosity of sodium silicate must be considered as a function of concentration, density, ratio, and temperature. Viscosity's relationship with other properties of sodium silicates is depicted in Figures 3 through 6.

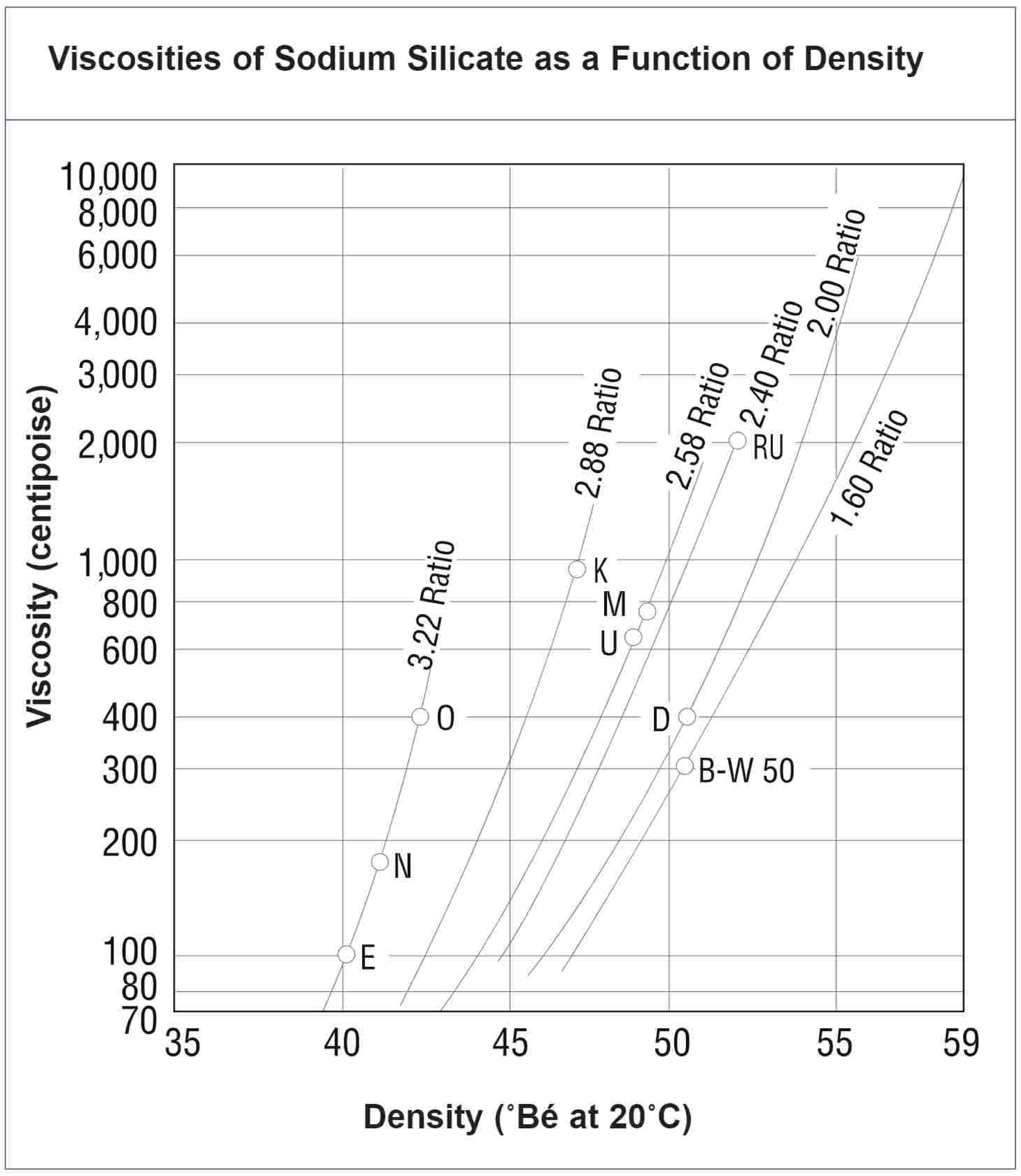
Concentration. Viscosities of more siliceous (higher ratio) silicates increase with increasing concentration more quickly than viscosities of more alkaline compounds (Figure 3).

Figure 3



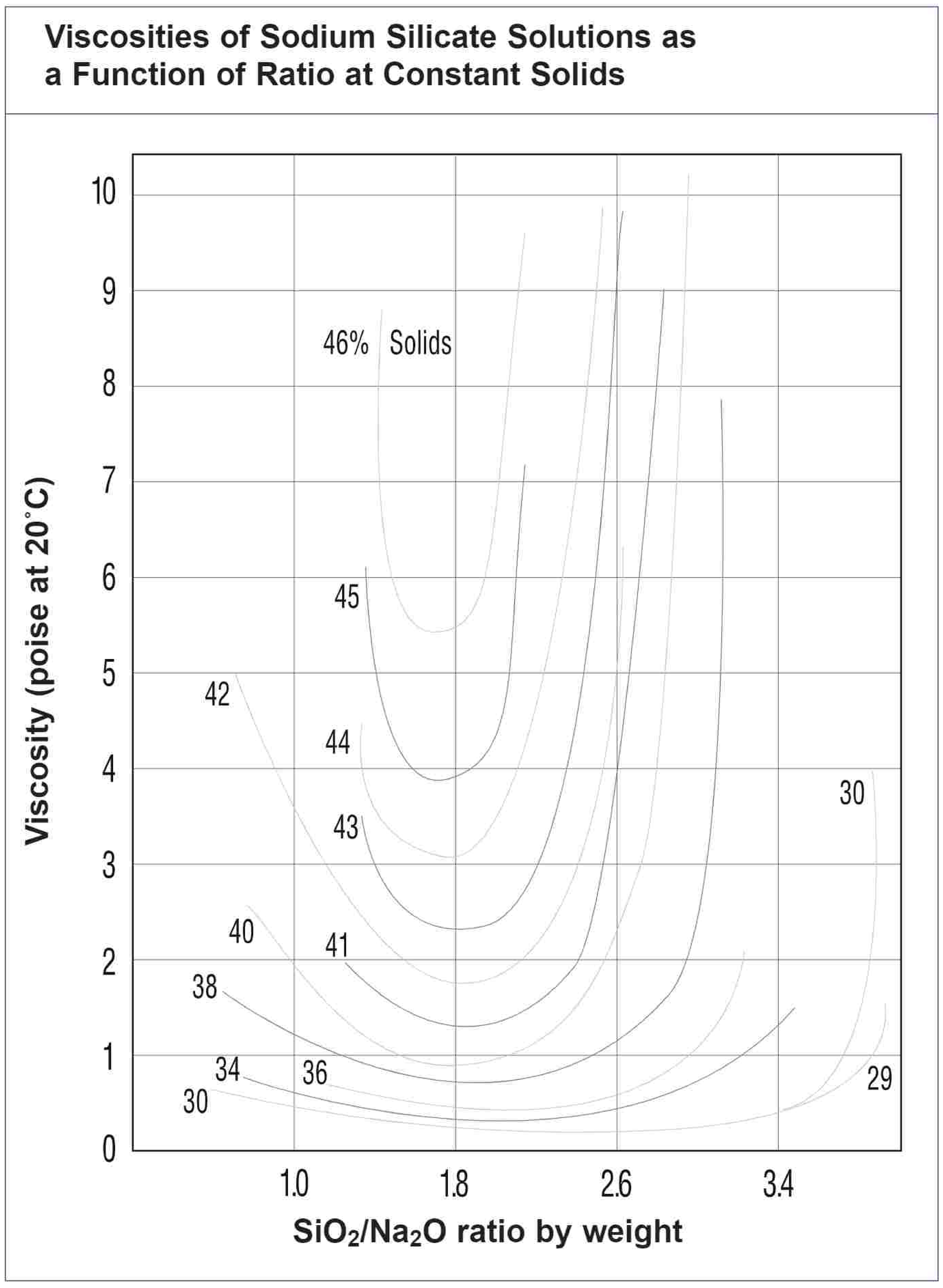
Density. When water is removed, the viscosity of sodium silicate solutions increases (Figure 4).

Figure 4



Weight proportion. The graph in Figure 5 compares viscosity with constant solids content but variable ratios. Silicate solutions have the lowest viscosity with a weight ratio of 2.0. Viscosity increases as either the siliceous or alkaline weight ratio increases.

Figure 5



Temperature. If sodium silicates (at commercial quantities) are heated sufficiently and evaporation is controlled, their viscosity can be decreased to less than 1 poise (Figure 6).

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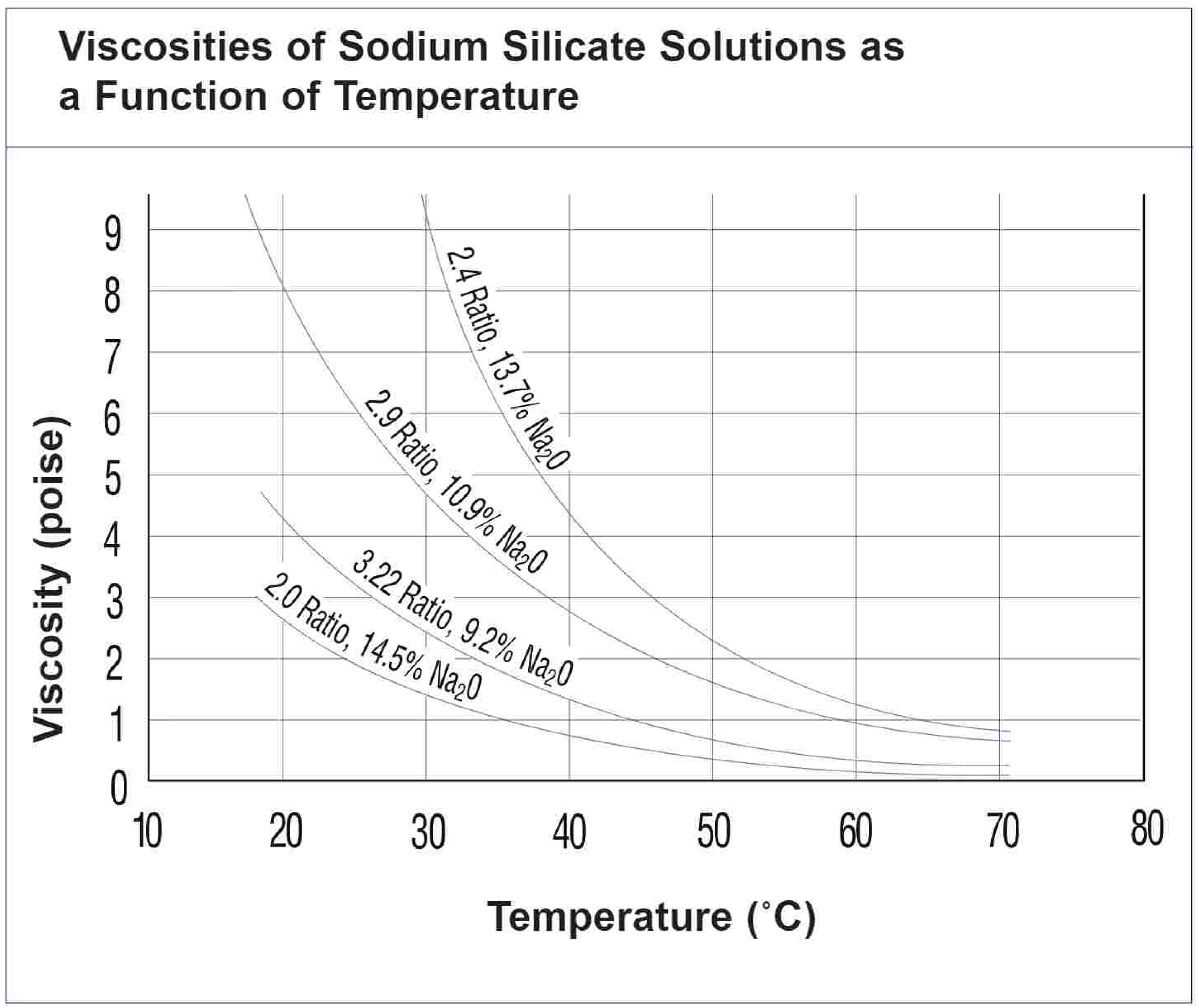
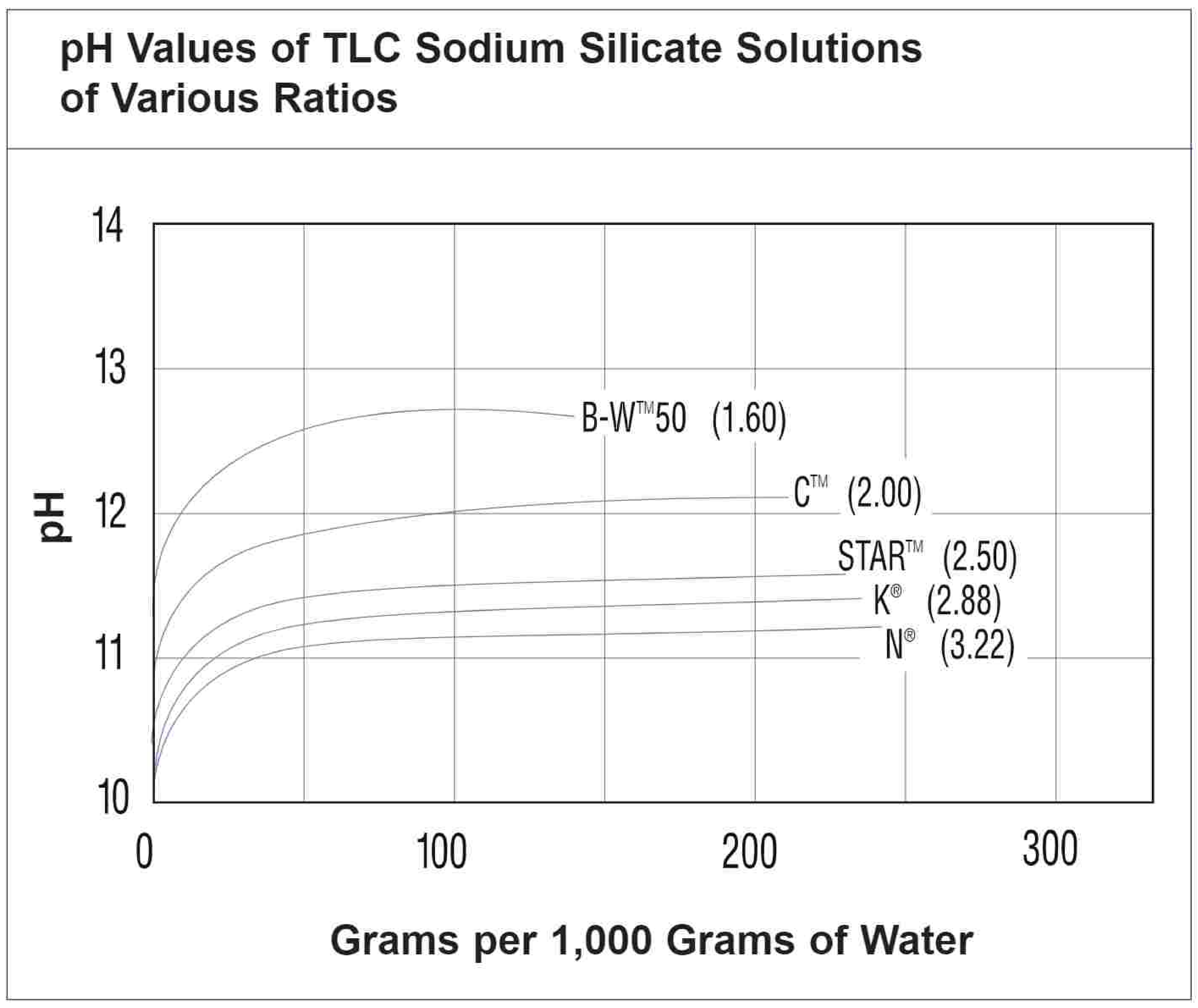
Figure 6



pH

The pH of silicate solutions is directly proportional to their content and ratio. pH falls with increasing ratio (Figure 7). Maintaining the high pH of silicate solutions until the alkali is nearly entirely neutralised. While this buffering activity – the capacity to withstand pH fluctuations – increases with increasing quantities of soluble silicate, even dilute silicate solutions will keep a rather steady pH when acid is added.

Figure 7



Evaluation of Silicate Solutions

A hydrometer is used to determine density. Since silicate solutions expand when heated, all measurements must be conducted at 20 degrees Celsius. Place the hydrometer jar in a water bath and fill it to a depth of approximately 1.5 inches. Fit the hydrometer with a one-hole stopper and lower it slowly into the silicate solution, taking care not to drop it. When the hydrometer reaches equilibrium, the reading should be rounded to the nearest 0.1°Bé.

By titrating a sample with standard hydrochloric acid and using either a methyl purple or methyl orange indicator, the Na2O concentration can be measured. The SiO2 content is measured using gravimetric techniques. The sample is dissolved in water, acidified with hydrochloric acid, and then dehydrated till dry in a steam bath. The precipitate is then separated, combusted, and weighed as SiO2. On request, TLC will share methodologies for the multiple quality assurance analyses we conduct when making sodium silicates.

Molecular Interactions of Sodium Silicates

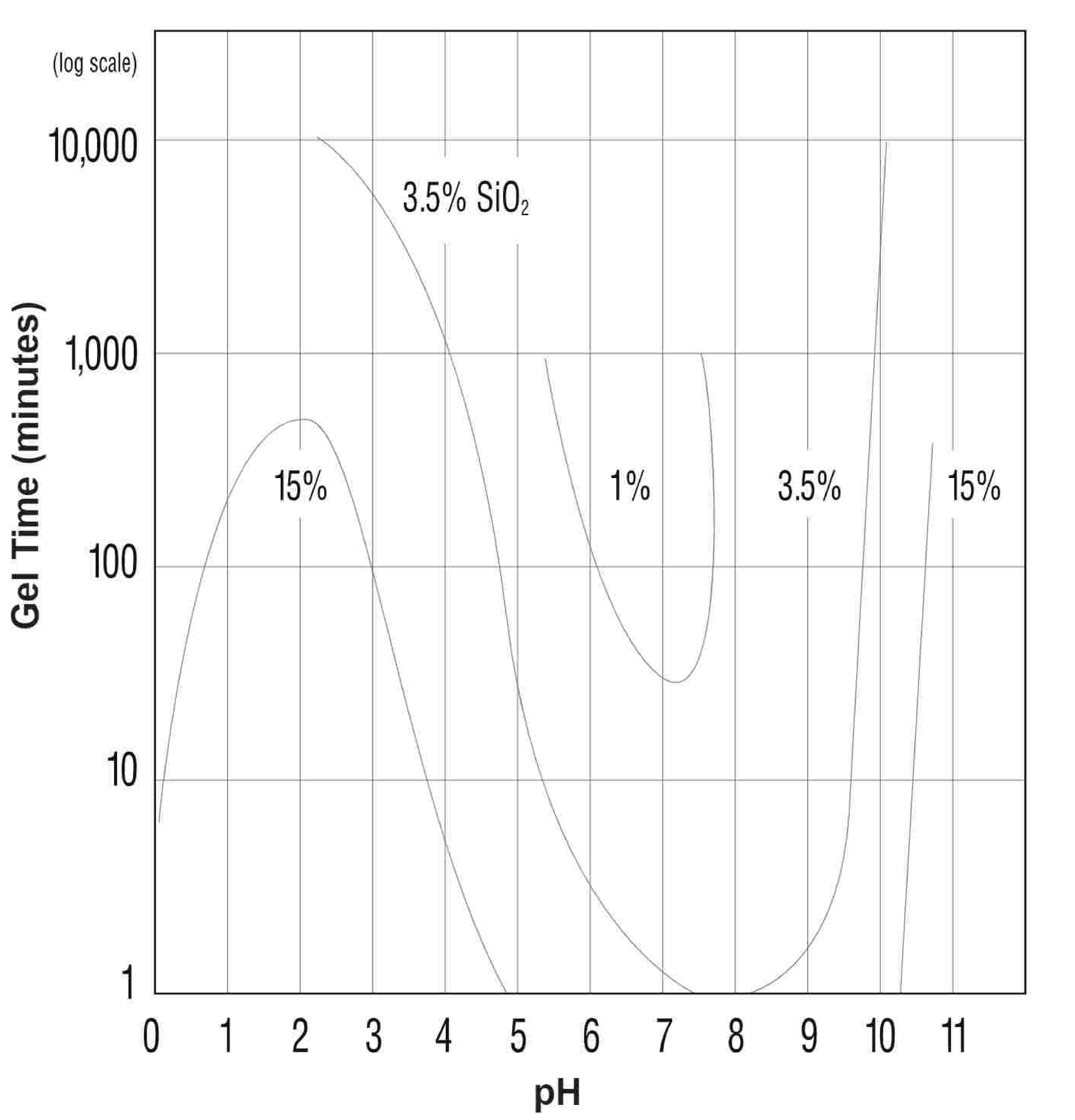
Solvation and Gelatination

Acidic substances react with sodium silicates. When reasonably concentrated solutions are acidified, silicate anions polymerize into a "gel." When relatively dilute amounts of dissolved silica are acidified, activated "sols" can occur.

The degree of polymerization of silicate anions is contingent upon solution concentration, temperature, pH, and other variables. Gelation happens most rapidly at pH levels between 5 and 8. (Figure 8). In the pH ranges 8 to 10 and 2 to 5, time-delayed gelation (instable sols) may occur. Sodium silicates can be converted into colloidal silica solution via ion exchange, dialysis, and other methods.

Figure 8

Gel Times of 3.22 Ratio Sodium Silicate – H_2SO_4 Mixtures at 25˚C



Colloidal silica solution is used for high-temperature binders in precision investment casting, synthetic polymer reinforcing, fabric finishing, and slip-resistant coatings, whereas activated silica is utilised for the clearing of municipal and industrial wastewater. The simplest way to produce silica gel is by neutralising a silicate solution with a mineral acid. To create desiccants, adsorbents, carriers, and catalyst supports, the wet gel is crushed, cleaned free of salt, and dried. Neutralization of silicate with acidic solutions or gases produces gel bonds with limited solubility, however they are fairly fragile and ephemeral.

Precipitation Responses

Solutions of sodium silicate react with dissolved polyvalent cations to precipitate. Depending on the circumstances (pH, concentration, temperature, etc.), either insoluble metal silicates or hydrated silica with adsorbed metal oxides or hydroxides are produced. This type of reaction can be utilised to produce pigments or compounds that can be utilised as extenders or fillers, ion exchange medium, catalysts, adsorbents, and other items.

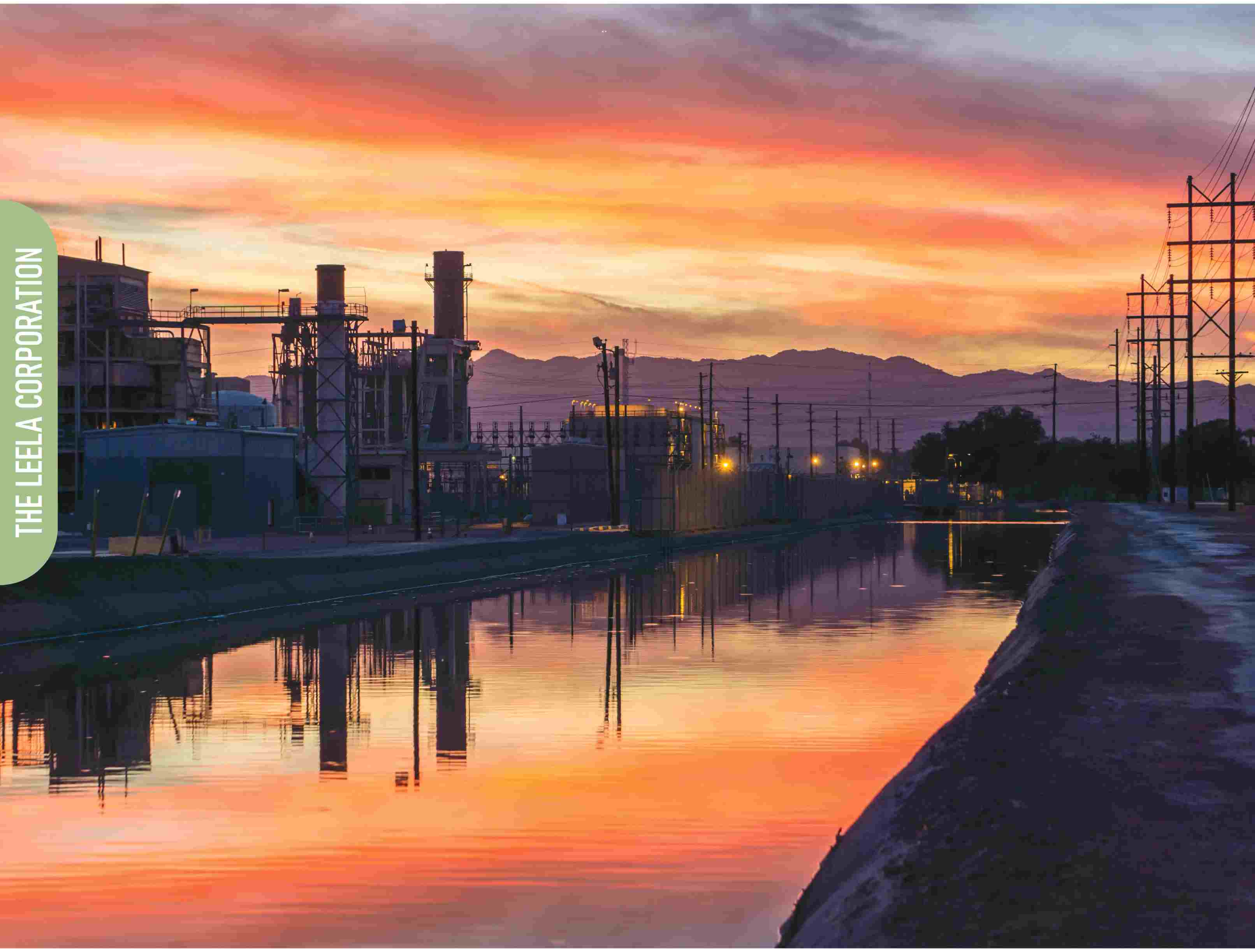
Calcium chloride reacts instantaneously with silicate solutions to give an efficient method of insolubilizing a silicate bond or coating.

After interactions with aluminium compounds, sodium aluminosilicates serve as ion exchange media for water softening and synthetic zeolite molecular sieves.

The degree and rate of silicate reactions with distinct metallic salts rely on the physical and molecular characteristics of the salt. Calcium carbonates, such as calcite, interact minimally with soluble silicate, whereas precipitated calcium carbonate is highly reactive.

Engagement with Organic Compounds

Comparatively few organic compounds are compatible with solutions of soluble silicate. Simple polar solvents can cause phase separation or dehydration. In mixes with water-immiscible oleophilic compounds, silicate separates into the aqueous phase; however, this can be avoided in liquid detergent formulations by adding an appropriate hydrotrope or emulsion stabiliser. A few miscible chemicals, such as glycerine, sorbitol, and ethylene glycol, are occasionally used as humectants or to aid in plasticizing a silicate sheet. Silicate solutions are gelled at a later time using organic ester setting agents. Over a lengthy period of time, the hydrolysis of the esters consumes the alkalinity of the silicate solution.



Storage and Procedures for Handling Sodium silicate

Although sodium silicates are intrinsically safe and eco-friendly, their alkalinity can cause skin and eye irritation. Ensure you are aware with the appropriate safety precautions and first-aid protocols before handling sodium silicates. Review and familiarise yourself with the Material Safety Data Sheets (MSDS) provided by TLC.

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