futuretech®

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A probing look at emerging technologies that will significantly affect industry.

Briefing on:

NONSTICK, WATER-REPELLANT, EASY-TO-USE COATING HAS HUGE MARKET POTENTIAL

Transportation, construction, power generation, medical, and dental applications

A novel, silicone-based, nonstick inert coating can be applied easily to any material to protect the surface from moisture, corrosion, chemical or biological fouling, and oxidation. The coating prevents unwanted substances -- water, ice, mildew, paint, natural or manmade detritus -- from adhering to treated surfaces, and seals water out of equipment and structures subjected to repeated heat/freeze cycles.

This innovative surface-treatment, called KISS-COTE by its developer, has marine, automotive, aviation, construction, power generation, ammunition and weaponry, computer and electronic, consumer good, medical, and dental applications. It serves as a high-performance mold release, as a lubricant, and as an additive to lubricants.

futuretech believes that this extremely versatile, safe, user-friendly surface treatment will enter multitiered markets -- from OEMs to end-user consumers -- in nearly every industry.

Kent Integrated Scientific Systems (KISS) developed the coatings and KISS-COTE, Inc. is commercializing them. The companies are interested in licensing arrangements, collaborative R&D, joint ventures or other strategic relationships with other companies.

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PERSPECTIVE

A family of novel silicone-based nonstick coatings developed as a plaque preventative offers the potential for varied applications far from its original intended use. These chemical- and corrosion-resistant, water-repellent, gas-permeable inert coatings can be applied to virtually any material to serve any or all of the following purposes:

Applications

- Protecting the coated material from moisture, corrosion, chemical or biological fouling, and oxidation.
- Lubricating the coated surface by reducing surface friction and drag and, when used as an additive, by improving the slipperiness and temperature stability of other lubricants or surface treatments.
- Preventing unwanted substances -- water, ice, mildew, paint, natural or manmade detritus -- from adhering to treated surfaces.
- Polishing and preserving metal and acrylic surfaces as a replacement for high-gloss wax.
- Sealing equipment and structures subjected to repeated heat/freeze cycles and keeping treated surfaces dry.
- Keeping water off one side of a treated surface while allowing vapors (including water vapors) from the dry side to pass out.

The new coatings share most of Teflon's desirable performance characteristics, but have few of Teflon's liabilities. Unlike Teflon, the coatings are easy to apply and require no preapplication treatments or postapplication curing. They are nontoxic, nonvolatile, and environmentally friendly. If the coating is damaged in use, it can be repaired easily and readily; repair of damaged Teflon is difficult and costly.

Every attempt at developing nonstick coatings has had to address the paradoxical problem that the very quality that makes such a coating desirable -- its lack of reactivity -- also makes it difficult to apply. Most non-

stick coatings are susceptible to cracking and delamination, or they wear down with exposure.

The new family of patented coatings, called KISS-COTE® by inventor Keith Kent, is made by crosslinking silicone so that one end of the polymer chain is extremely reactive and bonds tightly to the substrate surface. The other (nonreactive) end of the silicone molecule forms the inert and very smooth outer face of the coating.

Potential markets

Potential markets for these versatile coatings span every conceivable manufacturing sector and service industry, as the broad product and service categories reflect in this list of potential applications:

- Marine, automotive, aviation, agricultural, and horticultural equipment -- internal and external materials and surfaces.
- Commercial, industrial, and residential construction -- internal and external materials and surfaces.
- Lubricants -- wet or dry coatings; additives to conventional lubricants.
- Power generation, pulp and paper, and food-processing industries.
- Ammunition and weaponry.
- Computer and electronic equipment.
- Mold releases for all types of materials.
- Consumer goods -- clothing and shoes, eyeglasses, athletic equipment and recreational supplies.
- Medical and dental equipment and prosthetics; cardiac devices, artificial blood vessels, and wound-healing aids; cosmetics and personal care products.

In December 1985, Kent established Kent Integrated Scientific Systems (Tampa, FL) to oversee the development of products from inception

to end use and to provide consulting and problem-solving services to medical, scientific and industrial organizations. In October 1986, he founded KISS-COTE, Inc. (also of Tampa), to manage the production and marketing of his proprietary coatings.

Because both companies are small, and the potential applications of the technology are so varied, Kent is actively seeking licensees, co-developers, and joint-venture partners to develop the myriad potential markets for this promising technology.

IMPACT

In light of the diverse applications for KISS-COTE's technology, **futuretech** expects these coatings to have a broad impact on dozens of industries. Because the coatings will be applied to a range of materials for different reasons, at varying stages of the manufacturing process, there is no one typical scenario for the introduction of this technology.

Marine applications

The marine market has provided some of the most dramatic tests of KISS-COTE's performance. The coating was applied to panels of a fiberglass boat kept for nine months in the Gulf of Mexico. At the end of that period, all the accumulated marine growth -- including barnacles -- could be wiped off the panels by hand. Untreated surfaces had to be scraped with a sharp blade. At the end of a 24-month exposure, coated hulls could be cleaned with a light scraping. The accumulated marine growth had to be ground off the untreated hulls.

Subsequent testing demonstrated that vessels with coated surfaces showed reduced friction and improved performance in water. By reducing drag on the boat, the coatings reduce fuel consumption and boost sailing speeds. In sea trials of 12-meter racing yachts, speeds increased by up to 7% -- equivalent to two boat lengths for every 10 minutes of sailing time.

Treated powerboats showed similar improvements in speed and fuel economy.

This coating technology has been warmly welcomed by the high-performance boat racing community where it has been used on numerous prize-winning and record-breaking competitive vessels.

The US Navy is evaluating these coatings as a means of cutting maintenance costs. Treated with the coatings, the wooden parts of boats, sailcloths, and riggings shed water and resist corrosion, thereby lowering maintenance costs and increasing material lifetimes.

The coatings have entered the marine market as an aftermarket specialty treatment, primarily for racing and recreational vessels. If the technology is adopted by commercial and military shipbuilders, the coatings will probably be applied by manufacturers at the shipyard.

Automotive uses

One of the largest potential markets for these versatile coatings is the automotive industry. A one-time application of KISS-COTE to an automobile's exterior yields lifetime wax-water beading, thus making this a prime candidate as a wax replacement. The anticorrosive, gloss-preserving properties of the coating protect the body, undercoat, and chrome on a car, and lower maintenance costs. The drag-reducing capabilities increase fuel efficiency. Treated windshields benefit from water shedding and resistance to adhesion of ice, snow, dirt, and insects. The coating protects the car's finish and vinyl roof from damage due to temperature extremes. Treated automobile interiors resist soil and are easier to clean.

The coatings also will probably first enter the automotive market as aftermarket products. Automobile manufacturers will eventually recognize these coatings as a cost-effective way of adding value to their products and this will in turn dramatically expand the market for the coatings.

Aviation market

Aircraft treated with KISS-COTE enjoy the same benefits as sailing vessels and automobiles: ease of cleaning and ice removal, drag reduction, corrosion resistance, water-shedding, increased speed, reduced fuel consumption, and lowered maintenance costs.

The aviation market is likely to be opened by aftermarket purchases of these coatings by private pilots. Acceptance of the coatings by aircraft manufacturers, commercial airlines, and contract airplane maintenance companies will bring this market to its full potential.

Construction industry

The commercial, industrial, and residential sectors of the construction industry stand to benefit from these coatings, which provide waterproofing, resistance to corrosion, rust, acids, bases, solvents, detergents, and mildew and make cleaning easier. Applied to virtually any building material -- from glass to wood, to metals, masonry, tiles and concrete -- the coatings add value and enhance performance.

Coated steel structures resist rust and the harsh effects of concrete byproducts. Coated re-bar steel resists corrosive damage by concrete leachates, lasts much longer than many oil-based coatings.

Applied to masonry inside water and waste systems, the coatings protect against water damage and fouling, thereby reducing maintenance costs.

The coatings can be applied to a finished concrete structure for waterproofing, ease of cleaning, and protection. A treated sidewalk or driveway releases ice more readily than an untreated counterpart.

Applied to filler sand in concrete, the coatings waterproof the sand and reduce the water weight, lowering slump and easing the handling of the concrete.

On interior and exterior structures, these coatings effectively resist

graffiti and other forms of intentional or accidental surface defacement.

Because of their ease of application, the coatings can be introduced at virtually any point in a material's manufacture or use cycle. In most construction-related applications, the coatings add value in a particular setting, and are easily applied exactly where they're needed. This suggests that their earliest acceptance by the construction industry will come in their use as spot treatments.

Use of the coatings on bulk construction materials will impact on many sectors of the construction industry: KISS-COTE-treated shingles and roofing materials will not require as frequent maintenance or replacement as their untreated counterparts. Gas-permeable coated bricks seal moisture out of building walls but do not seal water vapor, thus helping to prevent mildew inside the walls.

Construction industry demand for the coatings will open opportunities for contract coating houses and building material manufacturers.

Lubrication

Laboratory and field tests of the lubrication capabilities of these coatings have only just begun. Early evidence demonstrates clearly that they increase the wear cycle and lifetime of treated wear parts, particularly those in sliding contact with one another.

Most conventional lubricants are slippery because of interfacial shear between molecules of the lubricant, and don't affect the solid surfaces they lubricate. KISS-COTE-based lubrication operates on a different concept: The coating changes the properties -- including the coefficient of friction -- of the solid material itself. Coated surfaces require smaller amounts of lubricants and less frequent lubricant changes than uncoated surfaces.

Power-generating industries

Three major sectors of the power-generating industry -- those based on wind, hydroelectric power, and fossil fuel -- are prime candidates for

applications of KISS-COTE technology. In all industries, these coatings decrease drag on moving parts and thus increase the efficiency of power production. Coated components have a longer life expectancy and require less maintenance than untreated parts.

Particulate matter and insect debris on the leading edges of a windmill blade can decrease power production efficiency by 40%. A coated blade resists attachment of debris and can be cleaned easily with a light water spray or by rainfall.

KISS-COTE treatment of hydroelectric generator parts increases their resistance to water damage, biofouling, and deterioration.

Fossil-fuel power generating plants enjoy the same benefits of corrosion and dirt resistance and increased operating efficiency. A key component in most fossil-fuel plants is the heat exchanger, a complex part that is easily fouled by mineral salts. Coating the inside of a heat exchanger decreases the need for frequent shut down and cleaning of the unit, and thus increases the efficiency of power output.

Zebra mussel resistance

One of the most critical applications may stem from the coatings' unique ability to impede the attachment of Zebra mussels to underwater surfaces. These coatings provide the most effective known method of thwarting the tenacious and prolific Zebra mussel, which encrusts ship hulls and clogging pipes -- including water filtration plant intakes, and power plant cooling systems -- in the Great Lakes of the United States.

Zebra mussels avoid KISS-COTE-treated surfaces and preferentially colonize any other available surface. If the only available surface has been coated, the mussels can attach to it but the adhesion is not secure: they can be wiped off the treated surface readily.

Military applications

Military equipment, including weapons and ammunition, is often used

under adverse conditions of moisture and corrosion. Preliminary evaluation of KISS-COTE coatings in military applications has yielded encouraging results: applied as a lubricant on the head of a projectile, the coatings enhance its speed and accuracy; they waterproof casings, reduce drag and corrosion in barrels, and protect weapon exteriors and stocks from rust and corrosion; they also reduce drag on torpedoes and missiles, to increase speed, range and accuracy.

A manufacturer of fiberglass radomes has been using the coatings to release water and ice which interfere with signal transmission and equipment performance.

futuretech expects that the military and defense markets for these coatings will be large and continuously expanding.

Maintenance market

Maintenance and cleaning service companies, which are responsible for countless millions of square feet of glass, tile, flooring, walls, countertops, window blinds, furniture, and public areas -- not to mention ceramic and metal fixtures, appliances, and equipment – will welcome an inexpensive and efficient way of keeping surfaces clean and making them easier to clean.

A company that is already established in the cleaning and janitorial supplies market would be well positioned to introduce these novel coatings to that market. The major disadvantage of doing so, however, is that the KISS-COTE line of products would seriously undercut sales of the conventional cleaning products.

Mold releases

A KISS-COTE lining protects any type of mold from most acids, bases, solvents, and detergents. When the mold is separated, the coating remains securely on the mold and does not transfer onto the finished part. Contamination of the manufactured part by the mold-releasing agent is a

serious problem in many industries, particularly those dealing with high-performance advanced materials.

The radome manufacturer mentioned previously and a manufacturer of molded swimming pools enjoy dramatic savings in time and labor by using these coatings as mold-release agents. The former reports that a single application of KISS-COTE, which takes about an hour, replaces seven applications (each taking an hour) of wax to their molds. The swimming pool manufacturer has also saved time and cut costs by using these coatings as mold releases.

Container treatments

Containers of all sizes and purposes -- from beverage cans and barrels to large shipping boxes to dumpsters and cargo containers -- constitute a natural market for protective, waterproof, easy-to-maintain coatings.

Food industry

Specialty shipping companies will probably be the first to experiment with KISS-COTE protection for their containers. Most of the food and beverage container applications will require USFDA approval, which could delay acceptance of the technology in this market.

Dental applications

The applications for which these coatings were first developed are likely to be the last ones to become commercial. Originally formulated as a dental treatment, the coatings inhibit the attachment of microbes and plaque to the teeth; protect teeth, fillings, and dentures from acid damage; and aid the cleaning of teeth. In the face of the administrative and financial demands of taking a new product through the lengthy FDA approval process, KISS-COTE's principals decided to first establish the technology outside the biomedical arena. The company is seeking partners experienced in the development of these and other medical and dental products. Some of these potential applications are:

Biomedical uses

- as a lining for artificial blood vessels, KISS-COTE prevents platelets

from sticking to vessel walls, thus reducing drag and improving the dynamics of blood flow;

- as a protective first-aid barrier, it resists dirt and microbial, bacterial, and fungal attack, oxygenates the wound, and promotes healing;
- as a coating for transcutaneous implants and catheters, it reduces irritation and infection problems;
- inside blood bottles, syringes, and needles, it reduces sticking and improves flow;
- on surgical instruments, the coatings protect against corrosion and lengthen tool life.

Cosmetics and personal care

Potential uses for these coatings in cosmetic and personal care products are in early testing. They appear to have a moisture-sealing, protective effect on chapped lips and hands exposed to harsh materials and conditions. Because the FDA does not regulate cosmetic and personal care products as rigorously as medical and dental compounds, **futuretech** expects that cosmetic and personal care products containing KISS-COTE formulations will appear on the market long before the coatings are used in medical equipment or dental treatments.

Although many biomedical and dental applications, and some cosmetic and household or restaurant applications of the coatings require FDA approval, the process may be helped by the fact that all the components of the product are medical grade.

Paper coatings

Paper plates and cardboard boxes, frequently coated with wax and other moisture-resistant materials, constitute another ready market for these coatings. They will also find use in the protection of books, legal documents and valued artwork -- paintings, statues, and the like. The paper industry will benefit from nonstick and easy-to-clean surfaces for the

inside of pulp processing vats and on rollers in the mills and in copy and printing machines.

The document- and artwork-protection capabilities of these coatings will likely be the first to be exploited in this sector, probably by libraries, museums, and document preservation firms. Paper plates and boxes for the food industry will need evaluation before they become practical. Use of the coatings on pulp and paper processing and printing equipment is a longer-term eventuality.

Consumer goods

OEM and aftermarket opportunities are available for applications of KISS-COTE technology to a wide assortment of consumer goods, including but not limited to large and small appliances, fences, decks, pools, and hot tubs; computer and electronic equipment; clothing and shoes; eyeglasses; athletic equipment and recreational supplies; agricultural and horticultural tools and equipment (such as lawnmowers and plows).

Additional markets will emerge in the cosmetic and personal care area: shaving gels that contain these coatings protect both the skin and the shaving equipment. Hand creams and lotions and antichap preparations preserve moisture in the skin and seal irritants out.

The particular opportunities, and the mode of entry of the coatings into the market, are as broad as the imaginations of the people applying the technology.

futuretech expects that, in the earliest stages of commercialization smaller, specialized companies will introduce the coatings in aftermarket items sold to end users. Once the markets are opened, larger companies -- chemical companies who manufacture the coating materials, and OEMs who use the coatings to add value to established product lines -- will begin to practice the technology on a larger scale.

It is not realistic to speak of a single unitary market for KISS-COTE's technology, as the diversity of potential applications tends to fragment the population of potential customers into countless special-interest groups, each of which must be approached from a sharply defined direction.

Expertise required

Making and using KISS-COTE's coatings requires relatively little specialized expertise. The materials used to manufacture the coatings are readily available, nontoxic, nonvolatile, and easy to handle. The coatings themselves can be applied by hand, painted or sprayed onto the substrate surface, or mixed with components of other materials (concrete, for instance) during formulation. Because the substrate surface requires no priming or pretreatment, and the applied coating does not need to cure, there is no danger of contamination during application.

According to the developer, the most difficult part of learning to use these coatings is understanding how *little* of the concentrate should be applied. Kent sees a major goal of R&D as being the development of product formulations appropriate to specific uses. Once this is resolved, the application is not technique-sensitive, and can be taught quickly to inexperienced operators.

Full-scale commercialization of these coatings could impact on a diverse and nearly limitless range of companies and processes. The coatings will compete with, and then replace, preexisting technologies in many markets. An important strength of these coatings is their ease of application at both the OEM and end-user levels.

STATUS/FORECAST

The basic concepts behind KISS-COTE's core technology have their foundation in Keith Kent's training in biomaterials during the early and mid 1970s.

While teaching and practicing maxillofacial prosthetics in Buffalo, NY, in the early 1980s, Kent became interested in the emerging science of surface chemistry and in biomaterials compatibility and materials processes. It was during this period that he developed the technology behind KISS-COTE coatings (details in "Technical Description" section).

Since 1985, when Kent began commercializing his core technology, he's received two US patents and several foreign patents on the process, developed broad experience in practicing it, and has begun exploring commercial applications with dozens of companies. Kent's companies have been financed through product sales, consulting services, contract R&D, and personal investment.

Kent and his wife, Renee, work full-time for KISS and KISS-COTE, Inc. Four more people work for the companies as part-time employees or consultants: mechanical and process engineer Vicki Risener; structural engineer Jim Fell; marketing and licensing specialist Adrian Horne, and communications specialist Don Thompson.

The major thrust of research at KISS has been the development of new formulations of KISS-COTE appropriate to the different uses for the product: the coatings can be formulated as aqueous or nonaqueous gels, or as aqueous solutions, with or without various carriers and additives. One formulation uses petroleum distillates. Another combines mild abrasives in a cleaning-and-coating preparation.

BARRIERS TO COMMERCIALIZATION

One of the greatest strengths of KISS-COTE technology poses one of the most formidable obstacles in the path to commercialization: Because these coatings have so many potential applications in so many different industries, it is difficult to reach all -- or even a large percentage of -- the

possible customers and R&D partners. And it is difficult to market a product that confers equally important benefits to radomes as it does to toothpastes or skin creams.

Another liability of the product is that it is so concentrated that a very small amount can accomplish a large task. A small dab of the product, for example, is sufficient to polish and protect an automobile hood. The developers hope to surmount this difficulty by offering the product in more dilute, higher volume forms.

MARKETS

The KISS-COTE family of surface treatments will penetrate innumerable specialty markets at all levels, from OEMs to consumer end users. A sampling of some of the potential markets for these coatings follows.

The $1 billion worldwide annual market for marine paints and coatings involves a complex international network of distributors and buyers.

There are three major distribution nodes for marine coatings:

- Shipyards that apply the coatings to new vessels. Most new ships are being built in South Korea, Japan, China, Taiwan, Yugoslavia, Poland, Denmark, W Germany, Italy, Spain, or Brazil, so these countries represent the principal loci of this market.
- Dry dock maintenance and repair facilities. These are concentrated in Singapore and Japan, where dry dock capacity, flexibility, and efficiency are high, and in South Korea, Dubai, and Portugal, where labor costs are relatively low.
- Sea stores. Located along major ocean trade routes, these stores sell paints for maintenance and repair of vessels at sea.

Three principal customer segments purchase marine paints and coatings at the abovementioned distribution points:

- shipping companies that own and manage fleets
- fleet management companies
- shipyards

KISS-COTE coatings have been well received by the pleasure and racing craft end-user markets and are being evaluated by potential buyers in the military and commercial segments. The company's extensive international trademark protection of the product is very important in this widespread and fertile market.

Most building materials in the United States are used within a 100-mi radius of their point of manufacture. There are are approximately 5,400 ready-mixed concrete operations, 1,100 concrete block and brick manufacturers, and 3,100 concrete product plants in the United States. Penetration of this market requires either that individual manufacturers become aware of the benefits of KISS-COTE coatings and offer treated materials to the local construction industry, or that the local construction firms request coated materials.

Approximately 507 million ft^2 of ceramic tile was made and shipped in the United States in 1990, and some 780 million ft^2 of ceramic tile was imported in 1990. The market for ceramic tile is expected to grow about 4% between 1991 and 1996.

In 1990, alterations, additions, and repairs to residential and nonresidential buildings each amounted to $111 billion in US trade. Repair and renovation of building infrastructures is expected to increase throughout the 1990s.

Polishes and sanitation goods accounted for $5.8 billion in product shipments in 1990, with the janitorial sector representing about 40% (some $2 billion) of the $4.8 billion institutional and industrial cleaner market. The

new coatings could add value to the performance of many polishing products and eliminate the need for other products.

Consumer items could represent one of the largest fields of application for these coatings. In just one sector of this market, upscale kitchen electrical appliances -- a typical application for the coatings -- US sales are expected to expand from $2.7 billion in 1990 to $3 billion in 1993.

TECHNICAL DESCRIPTION

The original goal of KISS-COTE technology was to develop a surface layer that presents a completely inert face to the environment, yet is securely bonded to the substrate it protects. The chosen preferred polymer is poly(dimethyl siloxane), one of the most nonreactive silicones known.

The critical step was to develop a catalytic process that makes a part of the polymer chain reactive, so that a secure bond forms between the coating and the substrate. The chosen polymer is resistant to most chemicals, provides a nonstick, nonwetting surface, and can only be removed by removing the substrate to which it is bonded.

The manufacture of silicone rubber involves extensive crosslinking between chains of polymer. As the reaction proceeds, the reactive end of each polymer chains reacts with another, forming a highly crosslinked network of polymer. Silicone is made by letting this crosslinking reaction proceed until all the polymer chain ends are linked.

KISS-COTE coating is made by adding an inhibitor to halt the crosslinking process prematurely. This leaves many highly reactive polymer chain ends available for bonding to the substrate. The crosslinked chains form the inert, nonreactive face, and the unreacted polymer chain ends react with the substrate to bond the inert layer to it.

The KISS-COTE material is a uniquely formulated type of surface treat-

ment that has most of the same properties as silicone: temperature, pressure, and chemical resistance and waterproofing capabilities, yet it adheres to surfaces and will not migrate. Correctly applied, a KISS-COTE surface treatment is approximately 100 Å thick.

HOW YOU CAN EXPLOIT

The types of companies well situated to adopt KISS-COTE technology were covered in the "Impact" section. Additionally, the technology raises opportunities for specialty coating boutique shops to apply coatings for OEMs and end users, on a contract basis.

Established coating shops could add these coatings to preexisting lines, or KISS-COTE specialty shops could form the core of a new industry. KISS-COTE is licensing the technology to specialty coating shops in the United States. A similar option is being explored for the European market by a KISS-COTE partner in Sweden.

Kent is interested in pursuing most types of licensing, joint, or contract research arrangements. He'd particularly like to connect with partners experienced in specific market areas that could benefit from these coatings. He is developing restricted licenses for marketing by territory and field of use. Licensees are not only entitled to use the protected technology, but will be given access to trade secrets not specified in the patents, and to Kent's experience in making and using the coatings.

For technical or licensing information about KISS-COTE, call Keith Kent, KISS-COTE, Inc., 12515 Sugar Pine Way, Tampa, FL 33624. Telephone: 813-962-2703. Fax: 813-961-0579.

KEY RESEARCHER

Keith Kent received his B.A. from Windham College in Putney, VT, and his D.M.D. from the University of Louisville School of Dentistry in Louisville,

KY. Between 1978 and 1982 he completed a residency in prosthodontics at the Veterans Administration Outpatient Clinic in Boston, MA; a clinical fellowship in prosthetic dentistry at the Harvard School of Dental Medicine, in Boston, MA; and a residency in maxillofacial prosthetics and a research fellowship in cancer education, both at Roswall Park Memorial Institute in Buffalo, NY.

Kent has practiced dentistry and maxillofacial prosthetics and consulted for several companies. He has written and lectured extensively throughout the United States, Europe, the Middle East, and South America.

PATENTS

KISS-COTE's technology is protected by two US patents. Patent applications have been filed in most major industrialized nations. Patents have issued in Japan, New Zealand, and the United Kingdom.

4,623,593 - Self-adhesive polymer composition for use as prosthetic appliance. Issued November 16, 1986. (Method of preparing a self-adhesive polymer material for prosthetic appliances by interfering with the polymeric crosslinking process before the material is fully crosslinked.)

Inventor: Keith Kent.

4,839,456 - Self-adhesive, drag reducing polymeric coatings. Issued June 13, 1989. (A method of creating a self-adhesive drag-resistant, fouling-resistant coating with an inert outer surface by interfering with the polymeric crosslinking process before the material is fully crosslinked.)

Inventor: Keith Kent.

Copies of patents are available from the Commissioner of Patents and Trademarks, US Patent and Trademark Office, Washington, DC 20231. Price: $1.50 per copy.

1. Kent, K. and R.F. Zeigel. 1982. Surface topography of silicone rubber prosthetic materials using conventional processing techniques. *J. Prosthet. Dent.* 48:698-702.

2. _____, R.F. Zeigel, Kenneth Kent, A. Frost, and N.G. Schaaf. 1983. Controlling the porosity and density of silicone rubber prosthetic materials. *J. Prosthet. Dent.* 50:230-236.

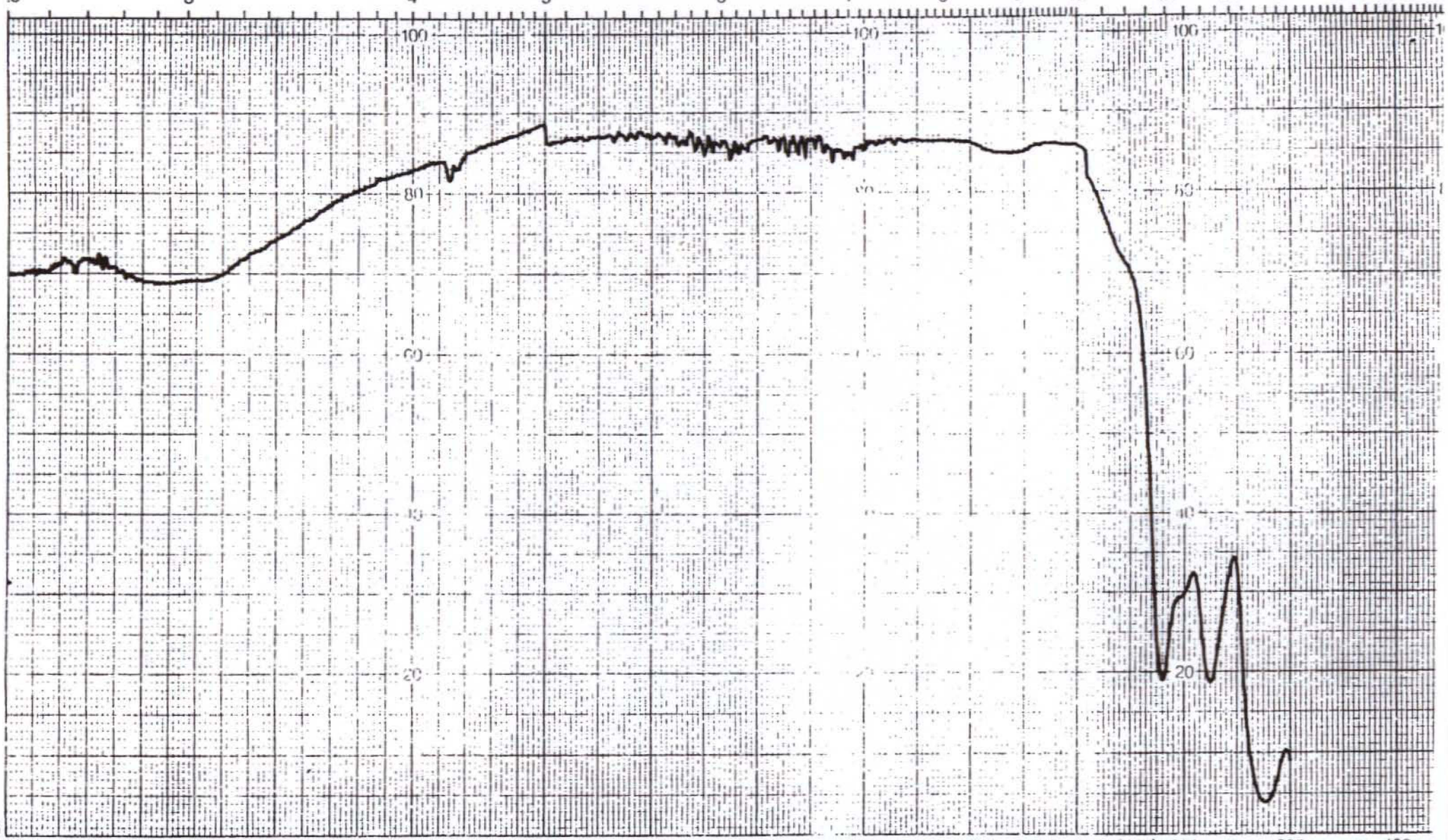
3. _____, R.F. Zeigel, R. Baier, and A. Frost. March 1983. The physical and chemical properties of silicone prosthetic materials that affect adhesion to human skin. *Book of Abstracts*, 185th ACS National Meeting. American Chemical Society, Washington, DC.

4. Vergo, T. and K. Kent. In press. Use of silicone rubber to restore defects of the head and neck region. *J. Prosthet. Dent.*

RESOURCES

PERKIN-ELMER®

CHART #199-1042



ABSCISSA	ORDINATE		
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SUPPRESSION	%T X ABS	MULTIPLIER	TIME DRIVE
		SLIT PROGRAM	OPERATOR BdH DATE

SAMPLE	REMARKS Baseline	SOLVENT	CELL PATH
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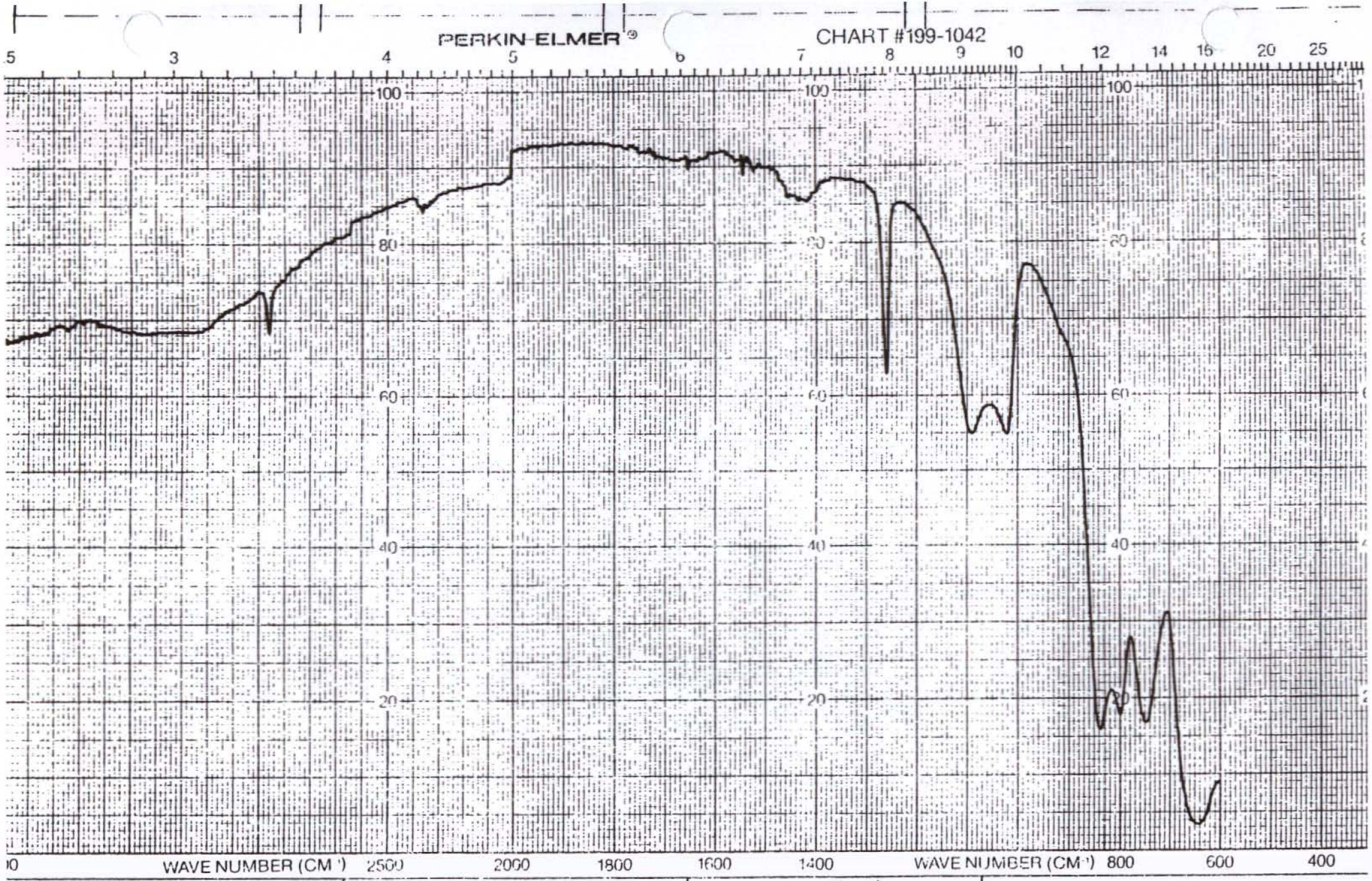

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SUPPRESSION	%T X ABS	MULTIPLIER	TIME DRIVE
		SLIT PROGRAM	OPERATOR BdH DATE 7/6

SAMPLE	REMARKS Kiss Cote	SOLVENT	CELL PATH
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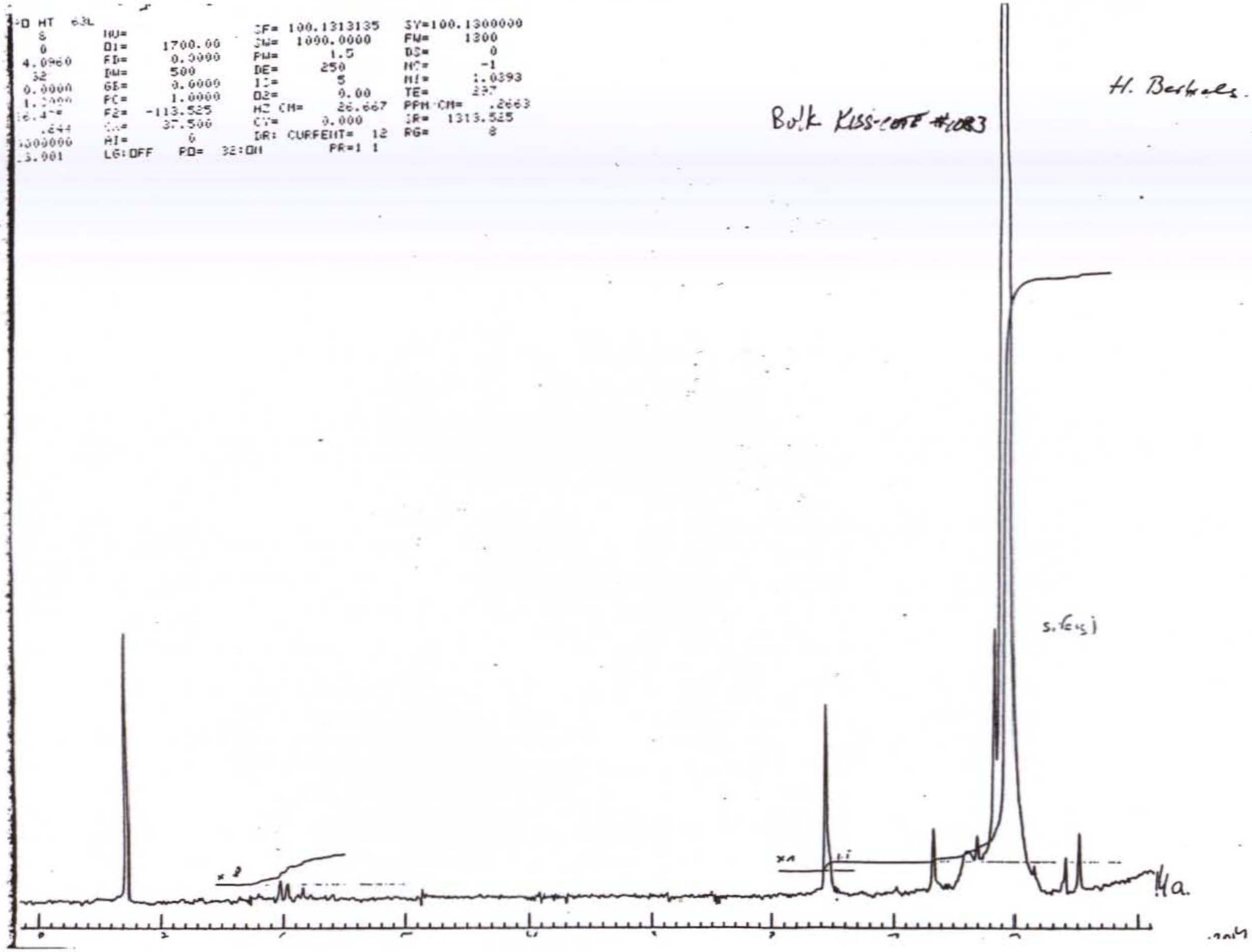

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