FDA REVISES PCB TOLERANCES UPWARD*

Of current interest is FDA's proposed regulatory control of polychlorinated biphenyls (PCB) as a contaminant in food. PCB are toxic chemicals having widespread industrial applications over a number of years. They have been used principally in electrical capacitors, transformer fluids, plasticizers, hydraulic fluids and lubricants, and heat transfer fluids. They were first reported in 1966 as potential food contaminants when they were discovered in fish from Swedish waters. Subsequent investigations identified several sources of PCB contamination or potential contamination of foods, i.e.,

1. Industrial Accidents

Preventable, isolated instances of direct leakage, spillage or contact of PCB fluids and PCB-containing materials on animal feeds, feed ingredients, and food during handling, processing, or storage.

2. Paper Packaging Materials

A significant percentage of food-packaging paper contains PCB and this can result in low levels of PCB transferring to the packaged food. However, the origin of PCB in such paper is not fully understood. Recycled paper containing carbonless copy has been identified as a primary source.

Analysis for PCB in food and the paper packages of 15 selected food categories showed that 67% of the packaging materials contained PCB residues with a high of 338 ppm. 19% of the foods examined contained an average of 0.1 ppm of PCB with a maximum of 5 ppm.

3. Environmental Contamination

Environmental contamination of lakes, streams, and air as a result of effluent PCB waste discharges and various industrial uses of PCB materials directly exposed to the environment has resulted in the indirect, widespread PCB contamination of fresh water fish.

In March 1972, FDA published a proposed rulemaking (followed by a Draft Environmental Impact Statement in May) to control PCB by minimizing and eliminating human exposure to PCB from dietary sources by dealing with identified sources. The proposal included a temporary tolerance of 5 ppm for food-packaging materials in order to limit the levels of PCB which could migrate from the packaging to the food.

There were objections to the proposed tolerance such as: its adverse effects on recycling programs and the economy of the recycling industry, discrimination against recycled paper; failure to recognize barriers as a means of preventing migration; inadequacies of test methods to assure compliance; and insufficient toxicological data to support the need for a tolerance.

The Final Environmental Impact Statement in the Federal Register of December 21, 1972, calls for a revision upward of the tolerance for food-packaging materials from 5 ppm to 10 ppm, and an exemption from the tolerance for food-packaging materials separated from the food by a functional barrier.

Industry data indicate that only 77% of the paperboard used for food packaging could meet the 5 ppm tolerance as of April, 1972, but that about 93% of the paperboard could meet a 10 ppm tolerance.

**Adapted from a paper by L. E. Buckley, FDA, presented at the 17th Annual Pulp and Paper Conference, Western Michigan University, Jan. 10-12, 1973.*

Talc Under Suspicion

Talc, an anhydrous magnesium silicate, is prior sanctioned for use in coating polished rice. It is also listed as GRAS for use in paper and paperboard for dry food packaging and in cotton and cotton fabrics for dry food packaging. It is also permitted in chewing gum base and as an antisticking or dusting agent in molding foods.

FDA published a proposal in August, 1972, which would amend the GRAS list, and it would formalize a prior sanction to define talc as a substance free of "asbestos-form" particles. In effect, talc containing asbestos-form particles in any food and as a migratory substance from food packaging material would be considered adulterated in violation of section 402(a) (1) of the Act.

This proposal was issued, in part, on the basis of a publication in *Science**, Sept. 17, 1971, which identified the presence of asbestos-form particles in talc used to coat rice. It is common knowledge that asbestos is carcinogenic when inhaled, and it may be injurious to health when ingested. Consequently, it was considered prudent to require that talc used in the manufacture of food and as a component of food-packaging materials be free of asbestos-form particles.

There has been difficulty in identifying asbestos in talc and FDA is in the process of evaluating procedures for the determination. FDA is also attempting to determine the extent of exposure of the average consumer to products containing talc.

**Based largely on conjecture that asbestos in talc used in polishing rice was responsible for the incidence of cancer in Japan (Editor's note).*

MONS 062921

For New Product Information and Literature See Pages 36-38

Focus on Pulping and Chemicals Recovery

New progress in pulping, especially sulfite pulping, and chemicals recovery are reviewed.

By A. W. J. DYCK

Has the trend to continuous pulping operations lost its steam, and will the ratio of batch to continuous pulping stabilize at a 50-50 level? According to M. Shaffer, (TAPPI Engineering Conference), somewhat less than half of the U.S. 109 kraft mills use Kamyr continuous digesters. As one evaluates the pros and cons of continuous vs. batch digesters in the paper industry, one gets the feeling that there may not be a significant deviation from this ratio for some years to come. Although the rationale of such an impasse is not easily explained.

One of the significant advantages of continuous pulping is the relative ease of bringing the process under digital computer control, which undoubtedly is the coming thing even though currently only 40% of the Kamyr continuous digesters reportedly are under such control. As the full implication of the H-factor (the time vs. temperature relationships in pulp cooking) and its effect on the Kappa number becomes apparent, computer control of the digester systems will become mandatory, if only to permit digester operations at full capacity, i.e. at the highest possible temperature at which pulp quality can be maintained.

It is claimed that few digester systems in the U.S.A. run at full capacity (Gudaz, Taylor Instruments, Tappi Engineering.) The main reason being the inability to control uniform pulp quality at the higher temperatures where the sensitivity of the delignifications reaction is outside the reach of manual control.

While advanced control applications to batch digester systems in the U.S. are practically non-existent, they seem to be finding increasing acceptance in Europe where such applications have resulted in high gains in productivity and yields. Major benefits include better digester scheduling, cook monitoring, cycle time control, and pulp uniformity.

Sulfite Vs. Kraft Pulping

The message of the 1972 International Sulfite Pulping and Recovery Conference held in Boston, Mass., was a definite challenge to kraft for dominance as a viable and effective pulping method. A great deal of credit for progress in sulfite pulping must go to Dr. Otto Ingruber, who has been active in the development of alkaline sulfite pulping systems at CIP's Research Center in Hawksbury, Ontario, for a number of years. The results obtained show that alkaline sulfite pulps obtained from spruce, mixed hardwoods, and southern pines have strength properties that are comparable to those of kraft pulps, without the disadvantage of the kraft odor. In bleaching, while higher brightness and greater brightness stability is obtainable by alkaline sulfite pulps, the cost of bleaching chemicals is no higher than for kraft pulps.

In the recovery of chemicals, either the Tampella or the SCA sulfite recovery processes can be used, with possible savings in air pollution control costs compared to those of the kraft system.

In this context, the possibility was suggested by J. V. A. Peltonen of replacing a 50-53% yield unbleached kraft softwood pulping system with a 55-65% yield alkaline sulfite pulp system for linerboard.

Another pulping process that could be a challenge to acid sulfite pulping is that of nitric acid, as described by H. K. Walter. Pulps produced by the nitric acid process at significantly higher yields than shown by kraft, are said to have the color of kraft and the strength of acid sulfite pulps. Capital and operating costs associated with a 56-58% yield unbleached nitric acid pulp are said to compare favorably with those of unbleached kraft pulp, even without considering the additional income from nitrogenous fertilizer and other by-products obtainable from this process.

Sulfite Chemical Recovery

A novel chemical recovery system for acid calcium sulfite systems was described by W. H. Stark. This method is based on the precipitation of calcium sulfite from spent liquor prior to evaporation of the weak liquor. While this is referred to as the first practical complete recovery process for calcium base liquors, it is also said to be applicable to magnesium and ammonia base liquors.

Another equally ingenious process relates to the sodium base chemical recovery. The mechanism involves, as a first step, the separation of sodium sulfide from sodium carbonate by partial solution of the smelt. This is followed by bisulfite sulfitation of the sulfide solution which yields sodium sulfite and hydrogen sulfide. The latter is burned to yield SO_2 which can be converted to Na_2SO_3.

Chemical Recovery

The use of a plug flow reactor in black liquor oxidation with molecular oxygen was described by Cooper, Rossano and Sarkanen of the University of Washington (TAPPI Alkaline Pulping Conference). Results seem to suggest the use of a two-stage process in which most of the oxidation would take place in weak black liquor, while the second step involving the oxidation of strong black liquor would be confined to a polishing action, to counteract reversion.