

# Synthesis Capabilities

Analytical Chemical Reference Standards



**AccuStandard<sup>®</sup>**

## About AccuStandard

AccuStandard, founded in 1986, is a leading manufacturer of Certified Reference Materials (CRMs). The company started in a business incubator co-sponsored by Yale University and The City of New Haven at the former site of Olin Chemical Company in New Haven, Connecticut, USA. Outgrowing that facility, the company moved across town in 1998 into a fully modernized facility of 37,000 square feet of laboratories, office and storage space. AccuStandard offers a comprehensive selection of organic, inorganic and petroleum reference standards for chemical analysis, serving the global market.

AccuStandard ships products to over 130 countries and maintains a distributor network in 85 of those countries. Since AccuStandard's inception the product line has grown to include over 12,000 Reference Standard products and twice that number of special formulations which have been developed for specific customer needs. Standards include those for EPA Methods, Pesticide Residue Screening, Flame Retardants, Biofuels, Plastic Additives, Dyes, Explosives, UOP and ASTM Methods and up-graded products for Physical Property analyses.

AccuStandard's quality system is certified to ISO 9001:2015 and is accredited to ISO Guide 34 and ISO/IEC 17025 as a Reference Material Producer for the manufacture of Certified Reference Materials.

AccuStandard owes its success in large part to the excellence, loyalty and dedication of its staff.

## Custom Synthesis

AccuStandard specializes in synthesizing chemicals of high purity to be used as reference standards. Custom synthesis capabilities range from milligram to kilogram scale. AccuStandard's Synthesis Department employs several PhD Organic Chemists with many years of pertinent academic and industrial experience. The experienced staff has developed hundreds of pure chemical compounds for companies, research, academic institutions and governmental agencies around the world.

AccuStandard is renowned for its quick response to customer requests for new compounds and its partnership in developing new methods. The offering of a wide variety of nonyl- and octylphenol ethoxylate derivatives, for example, led to the development of ASTM methods D7065-06 and D7485.

Featured in AccuStandard's history of firsts, are all of the 209 congeners of polychlorinated biphenyls (PCBs), and all of the 209 congeners of polybrominated diphenyl ethers (PBDEs).

A comprehensive collection of brominated flame retardants together with some of their metabolites is constantly being extended. Among the more recent introduction of unique products is a variety of metabolites of the flame retardant tetradecabromodiphenoxybenzene (TDBDPB): hydroxylated and methoxylated polybrominated diphenoxybenzenes.

Over 80 hydroxy- and methoxy PBDEs, as well as mixed bromo/chloro hydroxy- and methoxy-PBDEs have been added to the catalog due to requests by the research community.

The syntheses of many organic pollutants and their metabolites are an integral part of the department's efforts to provide the community with previously unavailable standards. This is especially true for the growing demand for reference standards for explosives and pesticides.

## List of Synthesized Products:

- PCBs (all 209 congeners), hydroxy, methoxy, and methylsulfonyl metabolites
- Chloro- and bromodibenzodioxins and furans
- PBDEs (all 209 congeners), hydroxy, methoxy, and chloro metabolites
- Fluorinated PBDEs
- Polybrominated diphenoxybenzene, hydroxy, methoxy (BDPB/HBDPB/MOBDPB) metabolites
- Alpha-, beta- and gamma-hexabromocyclododecane (HBCD)
- Other brominated flame retardants
- PBBs
- PAHs, nitro-PAHs and methyl-PAHs
- Pesticides and metabolites
- Explosives and metabolites
- Nonyl- and octylphenol ethoxylates
- Mono- and di-phthalates
- Organophosphates
- Other rare chemicals

## Analytical Capabilities

- GC-MS, GC-FID, GC-ECD
- HPLC/UV, LC-MS
- NMR
- ICP, ICP-MS
- Access to additional analytical instrumentation possible if necessary

## Synthesis and Purification

- Milligram to Kilogram Glassware
- Inert Conditions Equipment
- Microwave Synthesis System
- High Performance Flash Chromatography
- Distillation Equipment – High Vacuum Distillation, Molecular Distillation (Kugelrohr), and Spinning Band Columns
- Parr Pressure and Hydrogenation Reactor

