

PART I	DEPARTMENT OF PERSONNEL SERVICES	5.555
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CHEMIST SERIES

Series Definition:

This series includes all classes of positions the duties of which are to advise on, administer, supervise or perform professional work in chemistry, including the investigation, analysis and interpretation of the composition, molecular structure and properties of substances, the transformations which they undergo, and the relative amounts of matter and energy involved in these transformations. This work requires full professional education and training in chemistry, including organic, inorganic, analytical and physical chemistry, and in some instances biochemistry, as well as general knowledge of related physical and biological sciences.

Chemists employed by the State Government are responsible for supervising, developing and/or carrying out chemical and physical tests and analytical procedures to determine the nature, composition, and properties of substances or compounds, and their conformance to legal requirements, contract provisions and/or accepted standards and the degree to which they vary from established requirements. Chemists also make qualitative and quantitative analyses of substances for use in clinical diagnoses and in support of research and development functions.

The following classification factors are used as a basis for differentiating levels of difficulty of chemist classes: (a) nature and variety of work; (b) nature of available guidelines for performance of the work; (c) nature of supervisory control exercised over the work; (d) originality required; (e) purpose and nature of person-to-person work relationships; (f) nature and scope of recommendations, decisions, commitments and conclusions; (g) nature and extent of supervisory control over the work of other employees; and (h) qualifications required.

This is an amendment to the Chemist Series and a retitling of the class CHEMIST V to CHEMIST VI, which was approved on April 11, 1969, and the first specification for the new class CHEMIST V.

DATE APPROVED: 6/22/79

/s/ Wayne J. Yamasaki  
for DONALD BOTELHO  
Director of Personnel Services

CHEMIST II

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Duties Summary:

Performs a variety of standard chemical analyses and physical tests in accordance with prescribed procedures in a laboratory; calculates data and test results, and keeps records; and performs other duties as required.

Distinguishing Characteristics:

Chemists at this level are given assignments designed to train and develop them in laboratory techniques and operating procedures in the subject-matter area with which the laboratory is concerned; to provide experience and training in the administrative policies, regulations, and technical programs of the laboratory and to provide them with knowledge of pertinent source materials. Assignments typically include standard gravimetric, volumetric, colorimetric, instrumental and other types of chemical qualitative and quantitative analyses; conducting physical tests to determine properties such as viscosity, tensile strength, and melting point; preparing test samples; maintaining and calibrating apparatus; preparing reagents standardizing solutions, etc. Incumbents of this class initially work under the close supervision of a chemist of higher grade, who determines the work to be performed and specifies the procedures to be followed; work is reviewed in progress and on completion for technical adequacy. As the incumbent gains competence, control of the work in progress is relaxed, although test results are reviewed in detail. Guides are detailed, and are usually directly applicable to work performed at this level; they consist of technical periodicals, handbooks, textbooks, laboratory manuals, standards, specifications, inspection reports, and materials in departmental files. The use of original judgment is, required in recognizing deviations from the norm occurring when standard methods are used and in devising minor deviations in standard techniques. Person-to-person contacts are usually limited to other employees in the organization to give or receive information.

Examples of Duties:

Makes physical and chemical analyses of commodities, such as food and drug products; analyzes air, water, and soil samples, or makes physical and chemical tests of construction materials; tests products for conformance with legal requirements and standards; makes examinations for preservatives, dyes or other adulterants or impurities; prepares standard solutions; cleans and maintains laboratory equipment and apparatus; prepares reports and records of test results.

Knowledge and Abilities Required:

Knowledge of: The basic theories, principles, and units of measurement in chemistry; the use, operation, and care of standard laboratory instruments; standard laboratory techniques; standard reference work and literature; general knowledge of areas of application of chemistry; working knowledge of related principles of mathematics and physics.

Ability to: Operate and care for standard laboratory instruments and equipment; follow written and oral instructions; apply fundamental principles and standard practices to assigned work; learn new principles, facts, and techniques; prepare clear and accurate records and reports.

CHEMIST III

5.557

Duties Summary:

Performs a variety of chemical and physical tests to establish the identity, composition, condition and/or quality of substances in a specialized area of assignment; and performs other duties as required.

Distinguishing Characteristics:

Chemists at this level are responsible for analyzing a variety of samples for which there are standard or established methods of analysis or for which the adaptation of standard methods is apparent. Assignments are typically limited to samples from one class or category of substances, related in structure or properties, such as food and milk products, water, air, soil, or construction materials. The analyses usually involve different theoretical considerations and call for techniques which may require facility with or specialization in difficult colorimetric, volumetric, gravimetric or other conventional methods, and require specialized judgments of quality or condition of samples analyzed. At this level, chemists are responsible for the accuracy and validity of results, which necessitates understanding the principles of the various kinds of examinations they perform, and includes making or confirming calibrations or standardizations of equipment and materials. Incumbents of this class apply knowledge of mathematics and physics, and in some situations knowledge of other sciences and technologies related to the work; they also apply statistical measures to establish the precision or significance of quantitative results. Guides are essentially the same as at the next lower level; however, chemists at this level are expected to detect instances when standardized procedures appear to be inapplicable because of the condition of

the sample, interferences encountered, or other circumstances, and to suggest modifications of procedures, alternate methods, extended examination or curtailed analysis based on their own evaluation of the problem. The supervisor typically assigns categories of materials to be examined, and the chemist at this level proceeds independently on the basis of precedent assignments to determine the type and extent of analysis necessary and the specific methods to be used. The supervisor is advised of the progress of assignments, and is consulted concerning unexpected results. On new types of assignments, the supervisor may specify the determinations to be made, suggest methods to be employed, and the criteria to be used in evaluating results. The supervisor may also confirm the adequacy of results for regulatory, specifications compliance, or other purposes of the work. Person-to-person work relationships with personnel outside the immediate laboratory are usually for the purpose of obtaining technical information concerning the background and nature of substances being examined, or analytical methods that may be appropriate. Chemists at this level occasionally confer with project supervisors, operating officials, and representatives of private industry or other governmental agencies or departments to provide or obtain factual information concerning chemical specification or regulatory requirements and to discuss test results. An incumbent of this class may be responsible for assigning work to and reviewing the work of one or two laboratory assistants or lower-level chemists.

Examples of Duties:

Independently performs quantitative and qualitative chemical analyses and makes physical tests of a variety of substances in one or more specialized areas for conformance with federal or State laws, regulations, specifications, standards of quality or other requirements; performs chemical and physical analyses of samples of drinking water, sea water, free-flowing and impounded waters, sewage, industrial wastes, cesspool and underground seepages; analyzes milk and dairy products for fat content, total solids, specific gravity and contaminants; analyzes meat and other food products for preservatives, artificial coloring, or other adulterants, and for conformance with labeling requirements; analyzes food and agricultural produce for pesticide residues; performs physical and chemical analyses of air samples to determine nature, concentration and distribution of contaminants; makes physical and chemical tests of construction materials for conformance with federal standards and specifications; prepares and standardizes reagents; maintains and calibrates instruments; orders supplies and equipment as needed; performs necessary calculations; evaluates test results and prepares technical reports; may supervise and instruct one or two laboratory assistants or lower-level chemists; may participate in research projects.

Knowledge and Abilities Required:

Knowledge of: In addition to the knowledge required at the next lower level, work at this level requires a thorough knowledge of the principles of organic and inorganic chemistry, including qualitative and quantitative analysis; chemical laboratory procedures, techniques and equipment, including knowledge and understanding of the principles and applications of widely used analytical instruments; laws, regulations and standards pertaining to the area of assignment; maintenance of laboratory equipment.

Ability to: In addition to the abilities required at the next lower level, work at this level requires the ability to perform, analyze, and interpret results of chemical and physical tests; assist in the performance of research work on new testing techniques; record data and prepare comprehensive technical reports; work cooperatively with others.

CHEMIST IV

5.559

Duties Summary:

Plans, organizes and performs investigational and/or research activities in one or more specialized and complex areas of chemical analysis; is responsible for the operation of a small chemical laboratory in the area of specialization; or supervises several lower-level chemists in a unit activity of a large laboratory; and performs other duties as required.

Distinguishing Characteristics:

Chemists at this level are typically specialists in an area of chemical analysis, with independent responsibility for operation of a chemical laboratory in the area of specialization. Incumbents are subject to administrative supervision, and technical aspects of the work are generally accepted without review except in unusual or critical situations. Chemists at this level apply professional knowledge, experience, and judgment to developing, modifying or adapting standards, criteria, methods, tests, or analytical procedures in areas where standardized procedures have not been established, and in interpreting and evaluating analytical results. They may advise individuals outside the laboratory concerning the composition and properties of substances and commodities analyzed in relationship to regulatory requirements, suitability for specific purposes, research, etc. Incumbents of this class work in highly specialized, complex, and critical areas of analysis requiring advanced knowledge of

special techniques, complex instruments and equipment, and extreme technical precision or are responsible for a specialized unit of a large laboratory operation, with supervision over several lower-level chemists and assistants.

Examples of Duties:

Plans, organizes, and performs investigational and/or research activities in one or more specialized fields of chemical analysis requiring highly specialized techniques and instruments and extreme precision, such as radionuclide analysis of samples of milk, food, water, air, soil, and vegetation; toxicological analysis of specimens for medical and legal purposes; chemical and physical analysis of construction materials or other substances for acceptability and compliance with specifications and standards. Conducts research on unknown substances, and on new materials and analytical methods following recognized research procedures; may submit findings for publication, and/or attend and present findings in scientific meetings; evaluates and interprets test results, and recommends acceptability of materials, products or methods based on technical findings; modifies and adapts standard procedures and methods to meet laboratory needs; calibrates instruments; prepares and standardizes reagents and solutions; maintains and requisitions equipment and supplies; prepares technical reports.

Supervisory positions at this level are also responsible for assigning work to subordinates and reviewing work for accuracy and adequacy, making recommendations concerning organizational structure, recruitment, promotions and other personnel actions, evaluating employee performance, and recommending disciplinary action as necessary.

Knowledge and Abilities Required:

Knowledge of: In addition to the knowledge required at the next lower level, work at this level requires a comprehensive knowledge of the principles and practices of organic and inorganic analytical chemistry pertinent to the specialized area or areas; sufficient knowledge of the principles involved in the various methods of instrumental analysis to be able to evaluate their applicability to the classes of substances analyzed; technical and regulatory requirements and agency standards relating to assigned areas; knowledge of phases of related sciences and technologies sufficient to make proficient examination of substances not adapted for chemical analysis; as required, a knowledge of the principles and practices of supervision.

Ability to: In addition to the abilities required at the next lower-level, work at this level requires the ability to produce reliable analytical data and interpretations as a basis

for departmental action; select the appropriate methods, procedures, techniques or tests for specific problems; modify or adapt standard methods as required; supervise and instruct others in chemical analytical procedures; and deal effectively with industrial representatives and professional associates concerning technical issues.

CHEMIST V

5.560

Duties Summary:

Directs and supervises the activities in one or more specialized areas in chemistry in a moderate size laboratory section; and performs other duties as required.

Distinguishing Characteristics:

A position in this class is responsible for directing activities in one or more specialized areas in chemistry in a moderate size laboratory section. The work includes maintenance of effective relationships with staff, federal, State, and private agencies, and carrying out various activities for effective management of the laboratory such as budget estimating, seeing that adequate supply levels are maintained, recommending equipment purchases and supervising the work of and setting priorities of assignments for staff.

Examples of Duties:

Plans, directs, organizes, coordinates and evaluates activities in one or more specialized areas in chemistry in a moderate size laboratory section; determines priority of laboratory activities and assigns work to subordinate chemists, technicians, and assistants; analyzes, evaluates, interprets and summarizes subordinate chemists' data and prepares reports of the laboratory activities; serves as a technical consultant on chemical matters in the specialized area or areas in chemistry to scientific and professional people outside of the laboratory; estimates cost of various analytical procedures for projects, including operating, equipment, manpower and other related costs; maintains quality control on equipment to insure validity of data; maintains safety practices in the laboratory by conducting inspections and requiring personnel to adhere to safety rules, regulations and practices, and schedules personnel to attend safety courses; testifies in court to present analytical findings; reads technical journals, attends training programs, and attends and participates in meetings of scientific societies to keep abreast of developments in the specialized area or areas in chemistry; reviews and recommends changes on federal drafts of guidelines in view of Hawaii's unique environment relative to the specialized area or areas in chemistry; prepares budget

requests for the laboratory section and submits to the supervisor; performs supervisory functions such as assigning and reviewing work, evaluating subordinates' work performance, handling disciplinary problems, interviewing and recommending selection of new employees, providing training and selecting and sending employees to federal and State training courses.

Knowledge and Abilities Required:

Knowledge of: In addition to the knowledge and abilities required at the next lower level, work at this level requires knowledge of the trends in chemistry pertinent to the specialized area or areas and knowledge of the principles and practices of supervision.

Ability to: In addition to the abilities required at the next lower level, work at this level requires the ability to plan, organize, direct, and evaluate the work of others.

CHEMIST VI

5.561

Duties Summary:

Directs the activities in a large chemical laboratory section providing a variety of chemical analytical services to State, federal, and local government agencies and to private agencies and individuals; and performs other duties as required.

Distinguishing Characteristics:

A position in this class is responsible for directing, through subordinate chemist supervisors, the activities of a large chemical laboratory section providing chemical analytical services in several specialized areas to State and federal agencies, county police departments, hospitals, physicians, and others. Chemists at this level typically receive assignments in very general terms such as designation of activities for which analytical services are to be furnished; categories of materials to be examined, tested or analyzed; or problems to be investigated. Technical opinions and determinations of chemists at this level are usually accepted as authoritative, with the superior consulted only in matters of broad policy or budgetary considerations. Incumbents exercise independent judgment in determining the priority of laboratory activities; selecting, evaluating, modifying and/or developing analytical procedures; assigning work to and supervising work of chemical staff; and interpreting analytical results. Chemists at this level serve as technical consultants and may have extensive contacts with other State and local governmental agencies and with professional and scientific personnel and

organizations to give or secure scientific information and to coordinate chemical laboratory functions with other organizations and activities.

Examples of Duties:

Plans, organizes, directs, and coordinates the activities of a large chemical laboratory section, providing chemical analytical services in a variety of specialized areas, such as food analysis, water analysis, pesticide analysis and toxicology; determines priority of laboratory activities; assigns work to subordinate chemists, suggests possible approaches to solving problems, assists them as needed in the interpretation of laboratory data, and reviews their analytical reports for appropriateness of form and reasonableness of analytical results; evaluates and selects published analytical procedures and develops or supervises the development of new procedures when existing methods are unreliable, excessively time-consuming, or cumbersome; may personally perform laboratory analytical work in one or more specialized areas, such as analysis of drugs, medical devices, contraband materials, human, animal and plant tissues, food, water and other materials for identification and quantitation of drugs, poisons, pesticides, etc., for federal, State, and local regulatory agencies, and private medical organizations and individuals; testifies in court to present analytical findings; serves as a technical consultant on chemical matters to persons outside the laboratory; performs personnel management functions such as evaluating performance of employees, initiating requests for personnel action, approving leaves, and handling disciplinary problems; prepares technical reports and correspondence, initiates requests for equipment and supplies; is responsible for maintaining safety and neatness in the laboratory, and for safekeeping of reagents, equipment, drugs and contraband materials.

Knowledge and Abilities Required:

Knowledge of: In addition to the knowledge required at the next lower level, work at this level requires a knowledge of the principles and methods of toxicological analysis; trends and recent developments in all fields of chemistry and related biological and physical sciences; federal, State and local regulatory requirements, standards and issuances pertaining to food, drugs, water and other substances and products in the areas of assignment.

Ability to: In addition to the abilities required at the next lower level, work at this level requires the ability to serve as a consultant and speak for the department on technical matters; develop and maintain effective working relationships with professional associates and others.