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Autore	Voges R (Rolf)
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Nota di contenuto	Preparation of Compounds Labeled with Tritium and Carbon-14; Contents; Preface; Glossary; Author Biographies; 1 Introduction; 1.1 Physical Properties of Tritium and Carbon-14; 1.2 Purification; 1.3 Analysis; 1.3.1 Chemical Identity; 1.3.2 Chemical (and Enantiomeric) Purity; 1.3.3 Radiochemical (and Radionuclidic) Purity; 1.3.4 Specific Activity; 1.3.5 Position of Label; 1.4 Stability and Storage of Compounds Labeled with Tritium or Carbon-14; 1.5 Specialist Techniques and Equipment; References; 2 Strategies for Target Preparation; 2.1 Formulating Target Specifications 2.2 Planning Radiotracer Preparations2.2.1 The Construction Strategy; 2.2.2 Reconstitution Strategies; 2.2.3 The Derivatization Strategy; 2.2.4 Selection of an Appropriate Strategy; 2.2.5 Case Studies of Strategy

Development; References; 3 Preparation of Tritium-Labeled Compounds by Isotope Exchange Reactions; 3.1 Homogeneous Acid- or Base-Catalyzed Exchange; 3.1.1 Exchange without Added Acid or Base; 3.1.2 Exchange under Acidic Conditions; 3.1.3 Exchange under Basic Conditions; 3.2 Heterogeneous Catalysis with Tritium in Solvent; 3.2.1 Metals; 3.2.2 Other Catalysts
3.3 Heterogeneous Catalysis in Solution with Tritium Gas3.3.1 Metal Catalysts with Nonreducible Substrates in Aqueous Solution; 3.3.2 Metal Catalysts with Nonreducible Substrates in Organic Solvents; 3.3.3 Other Catalysts; 3.3.4 Metal Catalysts with Reducible Substrates; 3.4 Homogeneous Catalysis in Solution with Tritiated Water; 3.4.1 Exchange Catalyzed by Metal Salts; 3.4.2 Exchange Catalyzed by Organoruthenium Complexes; 3.4.3 Exchange Catalyzed by Iridium Dionates; 3.4.4 Exchange Catalyzed by Iridium Cyclopentadienides; 3.5 Homogeneous Catalysis with Tritium Gas; 3.5.1 Iridium Phosphines
3.5.2 Iridium Dionate Complexes3.5.3 Iridium Cyclopentadienide Complexes; 3.6 Solvent-Free Catalytic Exchange; 3.6.1 High-Temperature Solid-State Catalytic Isotope Exchange; 3.6.2 Thermal Tritium Atom Bombardment; 3.6.3 Other Radiation-Induced Labeling Methods; References; 4 Preparation of Tritium-Labeled Compounds by Chemical Synthesis; 4.1 Catalytic Tritiations; 4.1.1 Tritiation of Carbon-Carbon Multiple Bonds; 4.1.2 Tritiation of Carbon-Heteroatom Multiple Bonds; 4.1.3 Homogeneously Catalyzed Reactions; 4.2 Catalytic Tritiolyses; 4.2.1 Tritiodehalogenations
4.2.2 Tritiolyses of Benzylic N- and O-Functions4.2.3 Tritiodesulfurizations; 4.3 Tritide Reductions; 4.3.1 Sodium Borotritide (NaB3H4); 4.3.2 Sodium Cyanoborotritide (NaB3H3CN); 4.3.3 Sodium/Tetramethylammonium Triacetoxyborotritide [Na/NMe4B3H (OAc)3]; 4.3.4 Lithium Tritide (Li3H); 4.3.5 Lithium Borotritide (LiB3H4); 4.3.6 Lithium Triethylborotritide (LiEt3B3H, Li-Super-Tritide); 4.3.7 Lithium Tri-sec-Butylborotritide [Li(sec-Bu3)B3H, Li T-Selectride]; 4.3.8 Lithium [3H2]Boratabicyclo[3.3.1]nonane; 4.3.9 Tritiated Borane (THF-Complex) (B2 3H6; B3H3 .THF); 4.3.10 Tritiated Alkylboranes
4.3.11 Lithium Aluminum Tritide (LiAl3H4)

Sommario/riassunto

Compounds labeled with carbon-14 and tritium are indispensable tools for research in biomedical sciences, discovery and development of pharmaceuticals and agrochemicals. Preparation of Compounds Labeled with Tritium and Carbon-14 is a comprehensive, authoritative and up-to-date discussion of the strategies, synthetic approaches, reactions techniques, and resources for the preparation of compounds labeled with either of these isotopes. A large number of examples are presented for the use of isotopic sources and building blocks in the preparation of labeled target compounds, illustratin