

Candidate Name _____

Centre Number _____

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CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Advanced Level
CHEMISTRY
PAPER 3 Practical Test

9701/3

OCTOBER/NOVEMBER SESSION 2002

1 hour 15 minutes

Candidates answer on the question paper.
 Additional materials:
 As listed in Instructions to Supervisors
 Electronic calculator and/or Mathematical tables

TIME 1 hour 15 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

You may use a calculator.

You are advised to show all working in calculations.

Use of a Data Booklet is unnecessary.

Qualitative analysis notes are printed on pages 6 and 7.

FOR EXAMINER'S USE

1	
2	
TOTAL	

This question paper consists of 7 printed pages and 1 blank page.



Xtreme Chemistry Papers

**José Manuel Herrero Martínez, Manuel
Miró, Enrique Javier Carrasco-
Correa, María Vergara-Barberán**

Xtreme Chemistry Papers:

Paper Technology ,2005 3D Printing in Analytical Chemistry José Manuel Herrero Martínez,Manuel

Miró,Enrique Javier Carrasco-Correa,María Vergara-Barberán,2025-01-25 3D printing also known as additive manufacturing has received a growing interest in bio analytical science due to its capability for rapid and affordable prototyping reduced fabrication time and wide variety of materials and technologies currently available for increasing the plethora of functional print materials 3D printing in Analytical Chemistry will cover all the applications of 3D printed systems in relevant analytical areas such as sample preparation use of sorbents membranes and devices separation devices in analytical techniques as components in sensors and detection systems among others The book will also include key aspects about the preparation and design of novel 3D printed devices for analytical applications including tips and tricks written by experts The special features of the devices based on 3D printed structures for the different applications will be highlighted and the most relevant works will be covered in this book Therefore the information covered will be particularly useful for helping experts in the field to design select the adequate device and materials to conduct their research Presents the most important features regarding 3D printing in the Analytical Chemistry field helping researchers improve their applications Addresses adequate 3D printing technology for the desired application by giving tips and tricks including the most relevant applications reported in the last years Provides analytical researchers with a reference compendium on the use of 3D printing in extraction separation and sensing methodologies Johnstone Triangle Norman Reid,2021-01-18 Chemistry is often seen as a difficult subject to

understand This book focusses on the triangle model that Alex H Johnstone developed in the early 1980s Originally conceived in the context of making chemistry more accessible to a wider range of learners the model has been applied in almost every area of education in chemistry at all stages of learning In looking at why chemistry is difficult there are two central questions Firstly does the problem relate to the nature of chemistry and secondly does it relate to the way humans gain understanding Both were found to be important and the answers to the two question were found to be connected The triangle model arose from sustained research into human learning The central finding from research is the critical role of working memory and the model rationalises so much evidence from chemistry education research as well as the repeated experiences of teachers of chemistry at all levels In order to understand chemistry it is essential to develop sound mental models of molecular reality It generates major implications for the way a chemistry curriculum should be constructed and the processes of teaching and learning in chemistry when the goal is focussed on understanding the key ideas Some of these implications are developed and pointers offered to more successful ways forward The power of the Johnstone Triangle lies in the way it offers clear directions for all involved in chemistry education It is hoped that this book will prove helpful to all involved in sharing the exciting story of the way humans have come to understand the molecular world one of the great examples of great human endeavour Energy Research at DOE National Research Council,Division on Engineering and Physical Sciences,Board on

Energy and Environmental Systems, Committee on Benefits of DOE R&D on Energy Efficiency and Fossil Energy, 2001-12-12

In legislation appropriating funds for DOE's fiscal year FY 2000 energy R D budget the House Interior Appropriations Subcommittee directed an evaluation of the benefits that have accrued to the nation from the R D conducted since 1978 in DOE's energy efficiency and fossil energy programs In response to the congressional charge the National Research Council formed the Committee on Benefits of DOE R D on Energy Efficiency and Fossil Energy From its inception DOE's energy R D program has been the subject of many outside evaluations The present evaluation asks whether the benefits of the program have justified the considerable expenditure of public funds since DOE's formation in 1977 and unlike earlier evaluations it takes a comprehensive look at the actual outcomes of DOE's research over two decades **Science & Technology Review**, 2009 *Energy Materials* 2014 The Minerals, Metals & Materials Society (TMS), 2017-03-16 Popular Science, 2005-09 Popular Science gives our readers the information and tools to improve their technology and their world The core belief that Popular Science and our readers share The future is going to be better and science and technology are the driving forces that will help make it better **Official Gazette of the United States Patent and Trademark Office**, 2003 Scent and Chemistry Günther Ohloff, Wilhelm Pickenhagen, Philip Kraft, Fanny Grau, 2022-07-01 Scent and Chemistry Odor impressions have cast a spell over mankind since the dim and distant past But even today we are consciously or subconsciously guided by our sense of smell and the chemistry behind it The prominent fragrance chemists Günther Ohloff Wilhelm Pickenhagen and Philip Kraft convey the scientist the perfumer and the interested layman with a vivid and up to date picture of the chemistry of odorants and the research in odor perception In this second thoroughly revised and updated edition they are joined by creative perfumer Fanny Grau a rising master in this matter who complements the scientific treatise by a concise introduction to the art of perfumery and its composition techniques Besides this new chapter on the creative aspects of perfumery the book details on the molecular basis of olfaction olfactory characterization of perfumery materials structure odor relationships the chemical synthesis of odorants and the chemistry of essential oils and odorants from the animal kingdom backed up by many perfume examples and historical aspects It will serve as a thorough introductory text for everyone interested in the molecular world of odors **Scientific American**, 1865 The Guardians' Secret A.M. McPherson, 2024-04-16 Villains aren't the only ones good at keeping secrets Months ago Black Mold and his gang of villains attacked the city of Stalwarth leaving mass destruction in their wake Little did Ember and Aiden know it was just the beginning of the villains plans Ember is determined to uncover the truth about her parents murders But as she unearths secret after secret Ember wonders who she can trust Are the Guardians truly selfless heroes or are they just as conniving as the villains they fight Meanwhile Aiden's dream of becoming a Guardian is turning into a nightmare His power grows alongside his anger Is he cracking under the pressure or is something more nefarious at play Ember and Aiden promised each other nothing would tear them apart as they try to solve the secrets surrounding them But to keep that promise they'll have to risk the lives of those they love the

most *Advanced Materials & Processes* ,1992 **The Apollo Chronicles** Brandon R. Brown,2019 A uniquely earthbound story of space travel The Apollo Chronicles immerses readers in the obsessive lives and work of NASA s engineers from the starting gun of the space race through the triumphant Moon landings Filled with new interviews scrubbed of technical jargon and infused with the turbulent backdrop of the 1960 s the narrative follows a handful of main characters through their longest days tightest deadlines and most confounding challenges In the end the surviving engineers reflect How exactly did we do it and what did we learn **Advances in Artificial Life, Evolutionary Computation and Systems Chemistry** Federico Rossi,Fabio Mavelli,Pasquale Stano,Danilo Caivano,2016-04-02 This book constitutes the revised selected papers of the 10th Italian Workshop on Advances in Artificial Life Evolutionary Computation and Systems Chemistry WIVACE 2015 held at Bari Italy in September 2015 The 18 papers presented have been thoroughly reviewed and selected from 45 submissions They cover the following topics evolutionary computation bioinspired algorithms genetic algorithms bioinformatics and computational biology modeling and simulation of artificial and biological systems complex systems synthetic and systems biology systems chemistry **Advances in Computational Methods in Sciences and Engineering 2005 (2 vols)** Theodore Simos,George Maroulis,2022-05-04 This volume brings together selected contributed papers presented at the International Conference of Computational Methods in Science and Engineering ICCMSE 2005 held in Greece 21 aEURO 26 October 2005 The conference aims to bring together computational scientists from several disciplines in order to share methods and ideas The ICCMSE is unique in its kind It regroups original contributions from all fields of the traditional Sciences Mathematics Physics Chemistry Biology Medicine and all branches of Engineering It would be perhaps more appropriate to define the ICCMSE as a conference on computational science and its applications to science and engineering Topics of general interest are Computational Mathematics Theoretical Physics and Theoretical Chemistry Computational Engineering and Mechanics Computational Biology and Medicine Computational Geosciences and Meteorology Computational Economics and Finance Scientific Computation High Performance Computing Parallel and Distributed Computing Visualization Problem Solving Environments Numerical Algorithms Modelling and Simulation of Complex System Web based Simulation and Computing Grid based Simulation and Computing Fuzzy Logic Hybrid Computational Methods Data Mining Information Retrieval and Virtual Reality Reliable Computing Image Processing Computational Science and Education etc More than 800 extended abstracts have been submitted for consideration for presentation in ICCMSE 2005 From these 500 have been selected after international peer review by at least two independent reviewers **The Guardians' Daughter** A.M. McPherson,2021-09-21 In a world full of superhuman abilities not all dream of being a hero Ember s life is turned upside down the day villains brutally murder her parents No one comes to their aid including their comrades the other Guardians She loses her trust in the supposed heroes and vows to never follow in her parents footsteps A dark secret looms in Aiden s past and he aspires to become a Guardian as a way to cope At university he

meets Ember and an undeniable spark ignites between them But Aiden wrestles with his developing feelings for her and as they grow closer unexpected dangers threaten their bond including his secret Aiden struggles to open up about his past to Ember since it would reveal a troubling link to her parents murders and Ember finds herself questioning everything she believes to be true about Guardians Not only could Aiden s secret tear them apart but it may also lay the foundation for the Guardians undoing A M McPherson breaks onto the literary scene with a coming of age story full of romance suspense and mystery Fans of Renegades and My Hero Academia will enjoy this fresh take on a superhero world *Addresses in Commemoration of Josiah Parsons Cooke, LL.D. Late President of the American Academy of Arts and Sciences* American Academy of Arts and Sciences,1895 *Addresses in Commemoration of Josiah Parsons Cooke* American Academy of Arts and Sciences,1895 *Astrobiology* ,2003 *Annual Report of the United States Civil Service Commission* United States Civil Service Commission,1933

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