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Posters: The Good and the Bad

Sometimes, it helps to look at other posters to see what to do and what not do for your poster. In this module, you will see examples of posters with good and bad elements. Use these suggestions to create a poster that is visually appealing and effective. See the modules Designing a Poster and Poster Templates for more help creating a stellar poster.

Example 1




NOVA SOUTHEASTERN UNIVERSITY
COLLEGE OF PHARMACY

Availability and use of language assistance services in community pharmacies

Kevin A. Clauson, Pharm.D.¹, Maria Maniscalco-Feichtl, Pharm.D.², Hyla H. Polen, Pharm.D.¹, Craig D. Marker, Ph.D.³, Qing Zeng-Treitler, Ph.D.⁴, Daniel S. Jamass, Pharm.D.Cand.¹

¹Nova Southeastern University, College of Pharmacy – West Palm Beach, Palm Beach Gardens; ²Nova Southeastern University, College of Pharmacy, Davie, FL; ³Nova Southeastern University, Center for Psychological Studies, Davie, FL; ⁴Brigham and Women's Hospital, Harvard Medical School, Boston, MA



Introduction

- ▶ 19.4% of the US population speaks a language other than English at home and 8.6% has limited English proficiency (LEP)
- ▶ LEP patients suffer from limited access to care, receive poorer quality care, and are less likely to understand and adhere to care plans involving medications
- ▶ As a result, language assistance services (LAS) have been developed to help the pharmacy profession address these barriers

Terminology

Interpret: facilitate verbal communication for individuals who speak different languages

Translate: change written documents from one language to another

Objective

The purpose of this study was to determine the utilization of and barriers to accessing language assistance services (LAS) in community pharmacies for limited English proficiency (LEP) patients

Methods

- ▶ A 34-item survey was administered to assess LAS use and attitudes among a national sample of 500 chain and 500 independent community pharmacies
- ▶ Four mailings (i.e. pre-notification, survey, reminder, and replacement survey) were developed based on Dillman's Tailored Design Method
- ▶ Descriptive statistics were used to summarize the results and inferential statistics were used to measure for associations

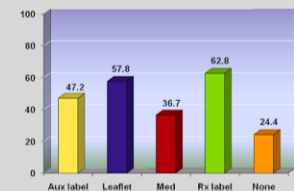
Results

- ▶ 296 surveys were completed and 26 were returned for a response rate of 30.0%
- ▶ Demographics: 63.1 % of responders were male, 36.9% were female; 44.9% independent and 55.1% chain pharmacies; 91.0% listed English as best language

Table 1. Most commonly requested



Written	Verbal
Spanish	Spanish
French	French
Vietnamese	Vietnamese
Chinese	Chinese
Polish	Italian

Figure 1. Written parts that can be translated (%)



Results – Summary of Challenges

- ▶ 52.8% of pharmacists with LAS do not notify patients about its availability
- ▶ A third of pharmacists (31.7%) report they do not have written LAS capabilities (e.g. Rx labels)
- ▶ Half (52.2%) of all surveyed are concerned about inaccuracies in translations/interpretations
- ▶ 23.9% of pharmacists believe LAS take too much time
- ▶ 21.4% are concerned about legal issues

Conclusions

- ▶ Substantial barriers to optimal LAS exist including availability, awareness, and efficiency of tools
- ▶ A disconnect between pharmacists and patients about LAS is also an obstacle to navigate; next step in research plan is to survey consumers
- ▶ Automated LAS kiosks, natural language processing, and use of social media are all tools that pharmacies may employ to improve LAS

Source: Kevin Clauson; Copyright License

The Good:

1. Nice use of bullets
2. Not too text heavy
3. The figures are all useful and break up the text
4. The columns are aligned to guide the reader to read vertically
5. The title is written using a good format (not all caps)
6. Sans-serif fonts

The Bad:

1. The grey textbox backgrounds give the poster a dull look
2. The list of universities and icons in the title block look cluttered
3. There is no reference section
4. The overall color scheme is not the most pleasant
5. The middle column is not centered- notice the different spaces in the blue margins on either side of it
6. Textbox outlines or wider margins would better separate the text from the background
7. The 3D graph would be better as a 2D
8. Section titles are not justified consistently
9. Figure captions are above the figures, and not all figures even have captions

Example 2

Genetic characterisation of coronaviruses in shelter dogs and cats in Lisbon

*Ricardo C Rosado** (rrosado@gmail.com), *Ana Duarte*, *Augusto Baptista*, *Filomena Oliveira*, *Ana Machado*, *Leonel Fernandes*, *Luis Tavares*
 *CISA, Faculty of Veterinary Medicine, Universidade Técnica de Lisboa, *DHURS, Câmara Municipal de Lisboa

Introduction

Coronaviruses (CoV) are classified into three different antigenic groups. Group 1 includes both canine (CCoV) and feline coronaviruses (FCoV) and group 2 includes the recently recognized canine respiratory coronavirus (CRCoV). CCoV has been further classified into two genotypes, I and II, the first with high genetic similarity with FCoV. Both genotypes are responsible for the occurrence of enteritis in dogs, which can be fatal when associated in mixed infections with canine parvovirus (CPV), especially in younger dogs. FCoVs have different classifications according to genotype and biotype. Due to their serological and genomic features FCoVs are classified as types I and II, where type I is strictly feline while type II resulted from a recombination event between FCoV and CCoV. FCoVs can be further classified into two biotypes. The enteric biotype (FECV) is present ubiquitously in cat populations, causing mild diarrhoea. The other recognized biotype of FCoV causes a lethal disease, feline infectious peritonitis (FIPV). This form with higher virulence only develops in a small percentage of animals, usually during primary infection and in kittens. The emergence of human coronavirus (SARS) has incited renewed interest in coronaviruses, and serological and virological investigations have reported worldwide presence and prevalence of these viruses in both domestic, as well as in free-roaming stray or feral dogs and cats. This knowledge is especially relevant in kennel and animal shelters. To investigate the genomic diversity of FCoV and CCoV in Lisbon's Municipal kennel, a virological survey was conducted which included canine distemper virus, canine and feline parvovirus, canine and feline coronavirus, feline immunodeficiency virus and feline leukaemia virus. All coronavirus positive samples were further characterized to assess the presence of different FCoV and CCoV genotypes within the animal population.

Materials and methods

50 faecal samples collected from cats between October and November 2008
 8 environmental swabs collected from two cages

RNA extracted using QIAmp MiniElute Virus Spin Kit

Samples subjected to RT-nPCR aimed at highly conserved ORF-7b (Herrewegh et al, 1995)

Reverse transcription
 1st PCR
 nested PCR

Positive samples to first RT-nPCR assay submitted to second assay to determine genotype (Addie et al, 2003)

FCoV I and II samples

Seven of the 8 environmental samples tested positive for FCoV RNA

Results

Cats
 FCoV I 25.7%
 FCoV II 17%
 FCoV I + II 54.3%

Dogs
 CCoV I 43.8%
 CCoV II 56.2%
 No amp 41.4%

All environmental samples tested negative for CCoV RNA

Materials and methods

49 faecal samples collected from cats between October and November 2008

16 environmental swabs collected from four cages

RNA extracted using QIAmp MiniElute Virus Spin Kit

RT-nPCR assay using different forward primers and common reverse primer to determine CCoV genotype (Pratelli et al, 2004)

Reverse transcription
 PCR

Discussion

The CCoV prevalence found was consistent with previous studies. However, some of the animals was positive for both genotypes, in contrast to 76.8% of samples identified by Pratelli (2004). Eight of the positive animals also tested positive for CPV, which is in agreement with the involvement of CCoV in mixed infections. Although this finding can be due to an important environmental presence of CPV, none of these animals had clinical history of diarrhoea, supporting the idea that CCoVs aren't usually related to clinical disease in adult dogs. Regarding FCoV, the prevalence found was higher than reported in other countries and significantly higher than previously found in stray cat population in Portugal (Duarte et al., Submitted). The large number and heavy rotation of animals in the Municipal kennel makes it difficult to implement an efficient sanitization procedure and the presence of viral nucleic acid in the environment caused by this could be responsible for this high prevalence. Previous studies in Portugal concerning the distribution of FCoV genotypes showed a higher prevalence of FCoV type I among domestic cats (Duarte et al., 2009). Among the animals in our study we found similar prevalences for FCoV I and II and yet the percentage of co-infection within the same animal was higher than previously reported. Unfortunately we have no available data to correlate these results with the presence of the FIPV biotype. The high prevalence of coronavirus infection found in both dogs and cats in the Lisbon Municipal Kennel allowed the viral genetic characterization, showing a high rate of co-infection with both genotypes of FCoV and absence of co-infected animals with CCoV I and II. However further investigation is needed in order to maintain a molecular epidemiological surveillance and help identify further CoV strains, as well as understand the pathogenic potential of these viruses.

Acknowledgements

This work was sponsored by CISA-FMV as part of the Integrated Master Degree in Veterinary Medicine. We are grateful to our colleagues and all the employees of the Lisbon Municipal Kennel for their collaboration and assistance in the collection of biological samples.

References

Addie, D. D., Schiapp, E. A. T., Nicholson, L., & Jarrett, O. (2003). J Gen Virol, 84(10), 2735-2744.
 Duarte A., Pereira da Fonseca L.M., Almeida V., Madeira de Carvalho L.M., Monteiro J., Frazão M.L., Tavares L., Vaz V., Submitted.
 Duarte, A., Vaz, L. & Tavares, L. (2009). Veterinary Microbiology. In Press, Cambridge Press.
 Herrewegh, A., de Groot, B., Capoen, A., Eggenfelt, B., Hazenak, M., & Rottier, P. (1995). J Clin Microbiol., 33(3), 684-689.
 Pratelli, A., Devere, N., Turchi, A., Marzola, V., Elio, G., Tompason, M., et al. (2004). J Clin Microbiol., 42(4), 1797-1799.

The Good:

1. Acknowledgements and references in their own section at the bottom
2. Logos at the bottom

The Bad:

1. Overall disorganized look
2. It is difficult to know which way to read this poster, even with the arrows
3. The large blocks of text are intimidating to read
4. Title font is too large compared to the rest of the poster
5. The images blend together and are thus hard to interpret
6. No consistency between sections: some sections are in text boxes and other are not
7. The dark backgrounds for the title block and references draw your eye away from the body of the poster

Example 3



SENDO Southern Europe New Drug Organization

AN INDEPENDENT NETWORK OF SCIENTISTS FOCUSED ON CLINICAL AND TRANSLATIONAL RESEARCH

F. Casali*, C. Casanovi*, P. Corbelli*, F. de Brauwer*, G. Del Conte*, M. Di Nicolò*, E. Gagliardi*, R. Giaracuzzi*, D. Hessa*, S. Martoni*, G. Pizzetti*, M. Realdinger*, C. Runggi*, S. Tassi*, Y. Tani* * Editors

* Istituto Oncologico della Svizzera Italiana (IOSI), Bellinzona, Switzerland; † Università di Insubria e Pavia, Varese, Italy; ‡ Istituto Europeo di Oncologia (IEO) Milano, Italy; § Fondazione IEOC Istituto Nazionale del Tumore (INT), Milano, Italy; ¶ Istituto di Ricovero e Cura a Carattere Scientifico "Galeazzi" (IRCCS), Milan, Italy; ** Ospedale Farmacologico "Mario Negri" (Ospedale Sesto), †† Farmacologico S. Felice, ‡‡ Università "Wolfgang Pauli" per Drug Engineering, Milano, Italy; §§ Università di Lieke, Lieke, Switzerland

Abstract

SENDO Foundation (SF) is an European Research Organization (ERO), founded in 1998 by the leaders of the European cancer centers (ECC). ...

Functional Facilities



To maintain a high standard of translational research and to keep with the main interests of the group, the choice of which new drugs are sought or accepted for development is decided by the New Agent Committee equally including clinical oncology and researchers ...

No. of active pending trials per year



The Foundation

- Academic Research Organization (ARO)
- Coordinating a small net-work of cancer centers in CH, Italy and Spain
- Dedicated to early drug development of anticancer drugs
- Founded in 1998 by the Directors of four prestigious European cancer centers
 - Prof. Franco Cavalli - Istituto Oncologico della Svizzera Italiana (IOSI) - Bellinzona (CH)
 - Prof. Franco Riba - Istituto Nazionale del Tumore (INT) - Milano - Italy
 - Prof. Silvio Garavito - Istituto Ricerche Farmacologiche Mario Negri Milano (IRFM) - Italy
 - Prof. Umberto Veronesi Istituto - European Institute of Oncology Milano - Italy

Operational Resources

- Clinical development strategy
- Preclinical & translational strategies
- Protocol & medical writing
- Studies coordination & logistics
- Clinical Operations
- Customized Data Management
- Biostatistics
- Monitoring
- Regulatory affairs & IND preparation
- Safety data
- SOPs & QA-unit available
- IS studies sponsorship

Country participation (% trials)



The Objectives



Research Resources

SENDO offers a highly technical and broad range of essential preclinical & translational services in Italy, Spain and CH bringing quality and innovation to translational drug development partnerships

- Pharmacology/Efficacy models
- Biomarkers
- Drug metabolism & Pharmacokinetic
- Imaging
- Primary tumor and non-tumor tissue collection

SENDO Educational

SENDO also develops and implements innovative continuing medical education programs focused on translational research and drug development

- EUCENDO New Drugs in Oncology (Reference: CH, Milano) 16 courses since 2010 (dedicated to personnel involved in drug development)
- EuroSENDO Methodology of clinical trials (Reference: Italy) yearly course since 2008 (dedicated to young oncologists)
- SENDO Phase 1 methodology in oncology (Reference: Italy) yearly course since 2007 (dedicated to drug companies)
- Participation in several Master courses & Seminars (including GCP, biostatistics, programming & data management)

Countries



SENDO coordinates a small net-work of cancer centers offering a technological and methodological infrastructure (SENDO HQ) to its participating oncology and researchers throughout Italy, CH and Spain. The network comprises approximately 20 centers aggregated around the "core" of the original founding institutes.



In 2008 a partially detached SENDO HQ was created at the IEO to better service the increasing number of SENDO HQ requests and from 2011 the Hospital Group has 10 out of the 20 core, the former National coordinated cancer group.

10 Years Results

Since its inception SENDO has focused on 3 major areas of drug development: consulting with the scientific interests of the founding members (early drugs) and a particular emphasis on antiangiogenic and receptor (drugging) agents; collaborations with an increasing number of academic "start-up" startups of existing commercial drugs

	Target Therapy	New Cytotoxics	Smart analogs	Total
First in man	6	1	2	9
Phase III/II	14	3	2	19
Translational only	3	-	-	3
Total	23	4	4	31

- 25 new drugs brought to clinic with >10 different Pharma partners
- 63 trials conducted
- 1432 patients treated

SENDO Educational

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Core Facilities

SENDO Foundation HQ & Operational Office
600 sqm in Milano

SENDO CL-NET
Phase I
7 Core Institutes

Phase II
20 Institutes

SENDO Lab-NET
7 Translational Labs for (F&D)

Perspectives

SENDO is an efficient hybrid of academic clinical and preclinical expertise, involved in highly innovative translational drug development and supported by a technical infrastructure offering Pharma standards operative tools.

In the years to come SENDO will continue to:

- Contribute to international role
- Stimulate the partnership between academia & drug companies
- Fulfill the educational needs of translational drug development
- Recruit health and research agencies to early clinical research needs

SENDO participation to EU/National programs

- EU Framework 6 - STROKAS
- EU Framework 7 - ADONAS/ST
- Progetto Integrato Oncologia (PIO)
- Oncosuisse (CH)

CONTACTS

Silvia Rezzani - Administrator, Dr. ...

10 Years Results

In the last 10 years SENDO has designed 31 active trials per year (2008-2017) with 63 trials conducted and 1432 patients treated

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SENDO Educational

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- EUCENDO New Drugs in Oncology (Reference: CH, Milano) 16 courses since 2010 (dedicated to personnel involved in drug development)
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- Participation in several Master courses & Seminars (including GCP, biostatistics, programming & data management)

Source: Insightful Clinical Trials Search; Copyright License

The Good:

1. The sections are nicely aligned in columns
2. Pleasing color scheme
3. Section headings are highly visible
4. Use of figures instead of text

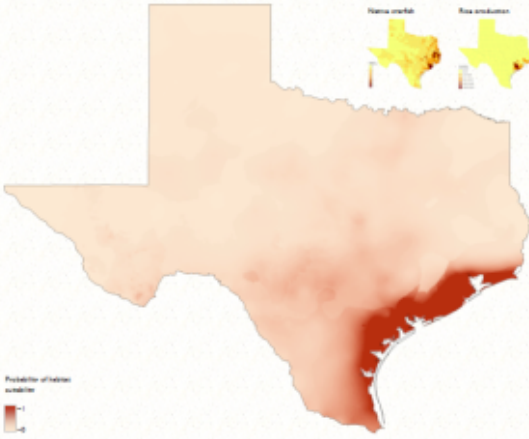

The Bad:

1. There is an abstract section
2. Too many sections
3. The logo is too prominent
4. The results are disjointed between two columns
5. Title is in all caps
6. The space between lines in the title is misleading
7. Unclear why the section headings are in different colors

Example 4

The parthenogenetic marbled crayfish, Marmorkrebs, in Texas

Teresa Patricia Feria and Zen Faulkes, Department of Biology and Center for Subtropical Studies, The University of Texas-Pan American



The most suitable habitats for Marmorkrebs in Texas are areas with high native crayfish biodiversity and rice production. Marmorkrebs could threaten Texas's 39 native crayfish species through competition, and eat rice meant for harvest, as they do in Madagascar (Jones et al. 2009). Pet owners and sellers need to be aware of the consequences of exotic species introductions. This work is in press in *Aquatic Invasions*.

References

Chucholl C, Pfeiffer M. 2010. First evidence for an established Marmorkrebs (*Decapoda, Anomala, Geostreptoacmeoides*) in Southwestern Germany in an urban ecosystem with *Orizetia linearis* (Rafinesque, 1817). *Aquatic Invasions* 8:402-412.

Faulkes Z. 2010. The spread of the parthenogenetic marbled crayfish, *Marmorkrebs* (*Procambarus* sp.) in the North American wetlands. *Aquatic Invasions* 8:407-408.

Johnson DK, Johnson NK. 2008. *Best Crayfish*. Greenwood Club (Deseret Crayfish Station, Texas).

Johnson DK, Johnson NK. 2008. *Best Crayfish*. Greenwood Club (Deseret Crayfish Station, Texas).

Jones PG, Reaser R, Hester A, Sun A, Gilmore S, Rasmussen MS, Rasmussen MS, Rasmussen MS. 2009. The exotic invader *Marmorkrebs* crayfish poses a new threat to Madagascar's freshwater biodiversity. *Biological Invasions* 11: 1475-1482.

Kawa T, Saitoh H. 2010. *The Biology of the Invasive Crayfish*. Hokkaido University Press, Sapporo.

Phlips R, Durr NL, Kawai T, van der Meulen C, Lohman C. 2010. The invasive Marmorkrebs (marbled crayfish) in the southeastern form of *Procambarus fallax* (Stewart, 1875). *Contributions in Zoology* 79: 107-118.

Schultz S, Boland A, Keller L, Reaser A, Hester A, Lohman C, Deaconoff F, van C. 2009. *Parthenogenesis in an invasive crayfish*. *Nature* 457:804-808.

We modeled Marmorkrebs' potential distribution using MaxEnt, with four sets of training data:

1. The distribution of Marmorkrebs in Madagascar (where they are an exotic species) and *P. fallax* in the U.S., plus single European Marmorkrebs in (European populations were found after this study; Chucholl & Pfeiffer 2010). This model probably best predicts the potential distribution.
2. The distribution of Marmorkrebs populations in Madagascar
3. The distribution of *P. fallax* in the U.S.
4. The distribution of Marmorkrebs in Madagascar and *P. fallax* in the U.S.

Texas crayfish distribution from Johnson & Johnson (2008, 2009).

Model of potential distribution of Marmorkrebs trained on Marmorkrebs in Madagascar; Europe and *P. fallax*

Model of potential distribution of Marmorkrebs trained on Marmorkrebs populations in Madagascar

Model of potential distribution of Marmorkrebs trained on *P. fallax*

Model of potential distribution of Marmorkrebs trained on Marmorkrebs in Madagascar and *P. fallax*

Visit us online at Marmorkrebs.org

Source: Marmorkrebs.org

The Good:

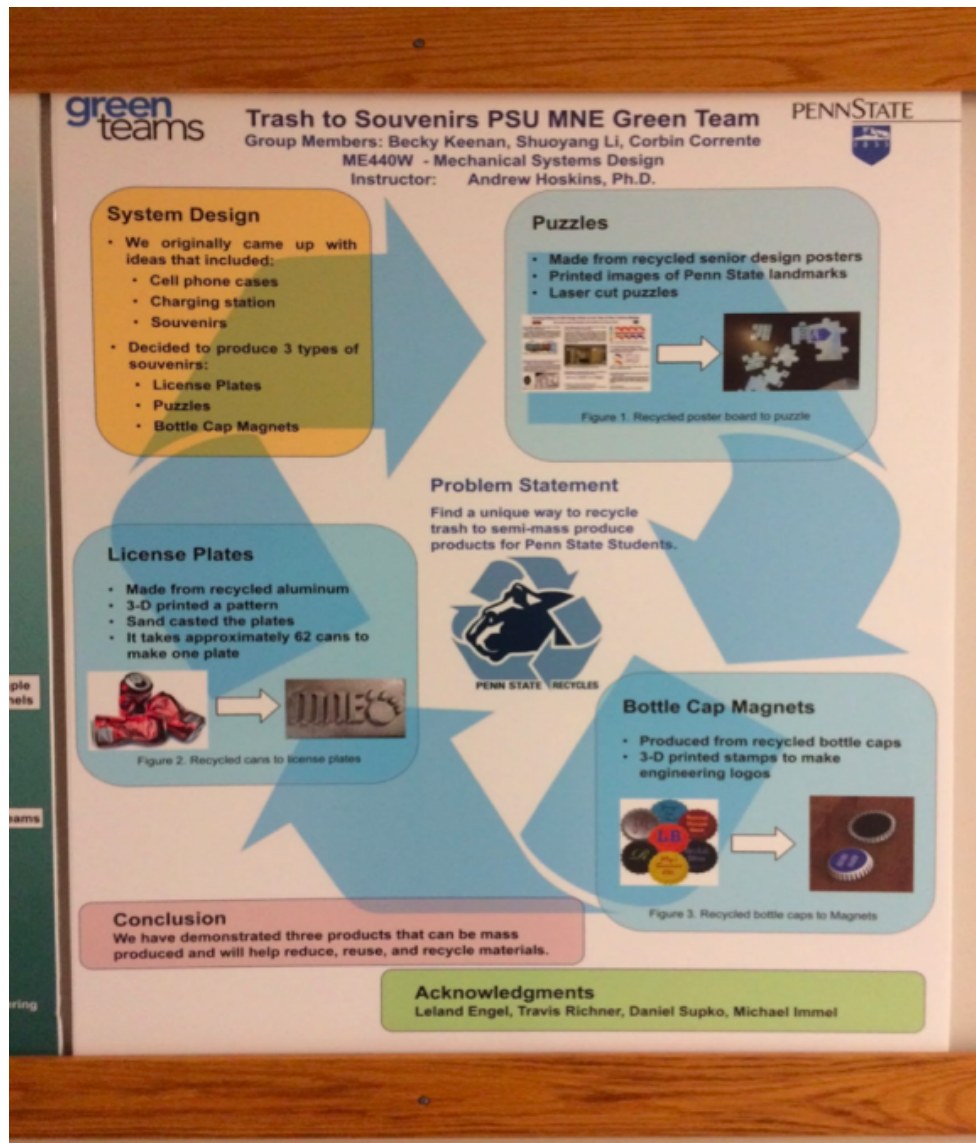
1. Pleasant color scheme
2. Nice use of a background texture
3. Title takes up entire width of poster
4. The model image is a good display of the main purpose of the study

The Bad:

1. Title is serif font

2. Enlarged letter at the beginning of each section is unnecessary and distracting
3. Sections are not labeled
4. It is unclear where to start reading
5. The text boxes are justified resulting in too much space between characters.
Note “potential” in the second paragraph, and “habitat” in the third.
6. Link to the website is too large
7. Note that the square shape of this poster is not the traditional 3’x4’ dimension

Example 5



Poster displayed in Penn State's Reber Building by Becky Kennan, Shuoyang Li, and Corbin Corrente


The Good:

1. Nice organization of text into different boxes
2. Good use of bullets
3. Not too many colors
4. Decent amount of white space

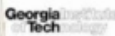
The Bad:

1. The order of what you should read on the poster is not logical
2. Flow of text would make more sense if overall if it was top to bottom, left to right
3. Awkward spacing for the class and instructor name at top
4. There is no reference section

Example 6



Reaction of Atomic Chlorine with Dimethyl Sulfide: Kinetics of the H-abstraction, Adduct Formation, and Adduct Dissociation Pathways



Paul H. Wine^{1,2}, Patrick L. Laine,¹ J. Michael Nicovich²

¹School of Earth & Atmospheric Sciences, ²School of Chemistry & Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332

Introduction

Dimethylsulfide (DMS, (CH₃)₂S) is emitted into the atmosphere in large quantities from the oceans and by volcanic processes and thought to play an important role in sulfate formation and growth in the marine environment. It is well established that the oxidation of DMS is initiated by reaction with OH, Br, and NO₂. There is also evidence that Cl atoms may play an important role as an oxidant for DMS in some locales. While there have been numerous laboratory^{1,2} and theoretical^{3,4} studies of the Cl + DMS reaction, quantitative assessment of the role of Cl as a DMS oxidant in the troposphere is still not possible because (i) Cl-adding cycles are not well understood and (ii) as a result of disagreement by published laboratory studies on the role and the mechanism of the Cl + DMS reaction is still established.

These experiments are reported that address three important elementary steps in the Cl + DMS reaction mechanism. First, S-dependent rate constants have been measured in 1 Torr of the bulk gas, i.e., under conditions where addition of Cl to the buffer gas is very slow and overall reactivity is dominated by the H-abstraction reaction. Also, P-dependent rate constants have been measured in 1 Torr of the bulk gas as a function of T. Finally, direct observation of equilibrium between Cl and (CH₃)₂S-Cl is observed at relatively high P and P, allowing for determination of (i) the S-Cl bond strength in (CH₃)₂S-Cl and (ii) the kinetics of (CH₃)₂S-Cl bond cleavage during either unimolecular dissociation.

Cl + (CH₃)₂S → (CH₃)₂S-Cl (R1)

Cl + (CH₃)₂CH₂ + M → (CH₃)₂CH-Cl + M (R2, R3)

Cl → fast either back to diffusion from detector field of view and/or reaction with background impurities (R4)

(CH₃)₂S-Cl → fast processes that do not regenerate Cl (R5)

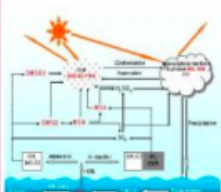


Figure 1. DMS Cladding in Marine Environment

Experimental Approach

We employ laser flash photolysis (LFP) coupled with time-resolved atomic resonance fluorescence (TR) spectroscopic detection of Cl to study the reaction of interest. All experiments were carried out under pseudo-first order conditions with [(CH₃)₂S] in large excess over [Cl].

Cl atoms were generated by 266 nm LFP of hydrogen: Cl₂/CO + Br₂(200 nm) → CO + 2 Cl (R6)

A schematic diagram of the experimental apparatus can be found elsewhere.⁵

To describe the pressure dependence of the bimolecular rate constant for this type of reaction, eq. 1 is frequently used:

$$k(\text{DMS}) = k_0 k_p \text{DMS}^2 / (k_0 + k_p P) - k_{-1} \quad (1)$$

$$k = (1 + (k_0/k_p)P)^{-1} k_0 k_p$$

At eq. 1, k₀ and k_p are approximations to the low and high pressure limit values for k₀ and k_p is the "transition parameter" often set to 0 for atmospheric chemistry applications.⁶ Figure 2 shows the total rate constant as a function of pressure of 200 K as well as the decomposition into the addition and abstraction components.

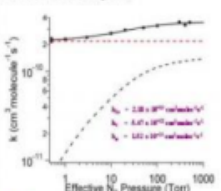


Figure 2. Plot of k vs Pressure for the addition of DMS. Solid line is the best fit to equation 1. Dashed red line is k₀ and dashed black line is k_p. Best fit parameters are given in the figure.

At T = 200 K and P = 100 Torr, reversible addition can be observed. The rate equations for the reversible addition scheme can be solved analytically, and yield a double exponential functional form for the Cl decay (see Figure 4):

$$k_0 k_p = k_0 + k_1 \exp(\beta) - (\beta + k_2) \exp(\beta) / (\beta - k_3) \quad (2)$$

In eq. 2, k₀ and k_p are the signals at times 1 and 0. The elementary rate constants are obtained from the fit parameters β, k₁, and k₂ and the measured k₀ and k_p.

Results

Kinetics of the H-abstraction pathway have been determined over the temperature range 225 K < T < 425 K by conducting experiments in 1 Torr of the bulk gas. Our results are compared with those of Diao-Miao et al.⁷ in Figure 3. The agreement between the two studies is good.

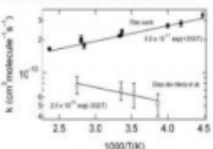


Figure 3. Arrhenius plot for the H-abstraction channel. Slope of Arrhenius expression are 1.07 kcal/mol (0.45 kJ/mol).

At eq. 1, k₀ and k_p are approximations to the low and high pressure limit values for k₀ and k_p is the "transition parameter" often set to 0 for atmospheric chemistry applications.⁶ Figure 2 shows the total rate constant as a function of pressure of 200 K as well as the decomposition into the addition and abstraction components.

The effective quantum yield for adduct formation dissociates is obtained from:

$$k_{-1} = k_0 k_p k_{-1} / (k_0 + k_p P)$$

$$k_{-1} = (k_0 - Q) + k_1 (CH_3)_2S-Cl / (k_0 + k_p P)$$

$$k_{-1} = Q + k_1$$

The effective quantum yield for adduct formation dissociates is obtained from:

$$k_{-1} = k_0 k_p k_{-1} / (k_0 + k_p P)$$

Typical data are shown below in Figure 4.

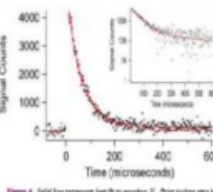


Figure 4. Solid line represents best fit to equation 2. Parameters are in the multiple fit table. Dashed line represents best fit to a single exponential. Experimental conditions: T = 421 K, P = 100 Torr, [(CH₃)₂S] = 0.1 × 10¹⁶ cm⁻³, [(CH₃)₂S] = 0.1 × 10¹⁶ cm⁻³. Best fit parameters are β = 2360 s⁻¹, k₁ = 1.07 × 10¹⁰ s⁻¹, k₂ = 1.0 × 10¹⁰ s⁻¹.

A third laser analysis was performed using equilibrium constants measured at T = 420K combined with a nearly T-independent enthalpy change of 700.28 ± 0.10 kJ/mol using previously published structural information.⁸ The third laser analysis gives a 206 K (CH₃)₂S-Cl bond dissociation enthalpy of 59 kJ/mol which is near the high end of a wide range of theoretical values reported in the literature.^{9,10} The above information allows the determination of equilibrium constants for adduct formation/dissociation at atmospheric temperatures which, in conjunction with determined k₀(T) values allow T-dependent rate constants for adduct dissociation to be evaluated (see Table 1 below).

T (K)	k ₀ (cm ³ molecule ⁻¹ s ⁻¹)	k _p (cm ³ molecule ⁻¹ s ⁻¹)	k ₁ (s ⁻¹)
200	4.12	1.8	2.5 × 10 ⁹
273	3.6	1.8	6.9 × 10 ⁹
298	1.9	1.8	2.6 × 10 ¹⁰
325	1.066	1.8	2.3 × 10 ¹⁰

Table 1. Equilibrium constants and adduct lifetimes obtained from the fit parameters of Cl + (CH₃)₂S → (CH₃)₂S-Cl. Values for each figure of P = 1 Torr.

Atmospheric Implications

- Even if the addition channel is reversible, the Cl + (CH₃)₂S reaction is fast enough to compete with either (CH₃)₂S loss processes by other competing back reactions.
- The lifetime of (CH₃)₂S-Cl toward unimolecular decomposition under tropospheric conditions is sufficiently long that other destruction pathways such as photolysis, loss and/or slow reaction with O₂ are likely to be important.

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The Good:

1. Clear flow of text
2. Organized sections
3. Good amount of visuals

The Bad:

1. Too much text
2. A lot of columns
3. Long paragraphs with no bullets
4. Harsh yellow text

Example 7

Clean Development Mechanisms Pre Assessment Tool – CDM-PAT: The e-tool steering towards the reduction of CDM transaction costs

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1. Scope

CDM - Pre-Assessment Tool (CDM-PAT):

- > Project developers will be able to quickly explore whether their project idea would qualify for eventual implementation under the CDM.
- > A freely accessible web-based project assessment tool which navigates project developers through four pre-assessment stages for the selection of promising CDM projects.
- > The clear menus and the user-friendly structure will also facilitate users who are less familiar with the CDM procedures and modalities.

2. CDM-PAT Structure

3. Sustainable Development (SD) Assessment

For every dimension of sustainable development a set of 11 internationally accepted criteria is used:

- Environment:**
 - 1. Reduction of greenhouse gases (CO₂)
 - 2. Sustainable consumption of natural capital
 - 3. Sustainable development
- Social:**
 - 4. Contribution to net-employment generation
 - 5. Make essential energy and energy services available to the poorest areas and poor people
- Economic:**
 - 6. Internal Rate of Return (IRR)
 - 7. Assessment of independent private companies' Sustainability
 - 8. Profit comparison towards emission credit investments
- Technological:**
 - 9. Storage efficiency of the CDM project
 - 10. Investment proportion of sustainable activities and components
 - 11. Extension of energy security and energy supply

Pair Wise Comparison: The project developer is compiling the criteria importance by comparing each one with the others.

Use of the Multi-Attributive Utility Theory (MAUT):
 $U(P) = \sum w_i u_i(x_i), i=1, n$

4. CDM-PAT Reports

Two customized reports: a *Brief* and an *Extensive*:

- > A first assessment of the project's financial viability
- > The impact of the risks identified
- > The additionality of emission reductions
- > Project's likely contribution to SD
- > An overall recommendation to the project participant as a CDM investment

5. Application to projects in the Mediterranean

CDM-PAT has been applied in 21 CDM project proposals:

- > 7 Mediterranean countries
- > 3 Solar, 6 Wind, 6 Energy Management, 1 Fuel switch to natural gas and 5 Waste

18 projects qualified for further assessment
 3 projects do not comply with the basic eligibility requirement

6. Conclusions

- > The recommendations of CDM-PAT on potential CDM projects in the Mediterranean region were favourable for:
 - ✓ Renewable Energy Sources projects
 - ✓ Energy Efficiency Technologies
 - ✓ Projects that contribute to the promotion of sustainable development, a cleaner environment
- > CDM-PAT may provide essential services to:
 - ✓ Potential CDM Investors
 - ✓ Host countries
 - ✓ CDM funding organizations

CDM-PAT Architecture

Completed CDM-PAT Forms

The Good:

1. Several compelling visuals
2. Good use of bullets
3. Clear flow of text

The Bad:

1. Small text
2. Too many colors
3. Justified text boxes make for awkward text spacing in section 3
4. Missing a references section