Knovel 在科学研究和日常教学中的应用

罗莹　工程部客户顾问　y.luo@elsevier.com

Knovel

Know More. Search Less.

Knovel的价值

有哪些主要挑战?

研究员

- 通过合作经营与商业工程领域有着非常密切的联系
- 想要跟上前沿
- 太多的时间花在寻找并对结果排序上
- 在截止日期前需要完成一个快速的文献检索以准备提案
- 需要找到领域内较活跃的学者并且评估可能的合作伙伴

工程学图书馆员

- 授人以渔，使得在大量内容中找到正确答案和数据点更为简单
- 教导学生在研究中不要过于依赖谷歌和维基百科
- 与教职工和学生们培养关系
- 需要在预算逐渐削减的同时继续为学生和教职工提供全面的资源
- 与多家厂商和平台打交道

能带来哪些价值?

大学研究员

通过提供广泛接触到相关内容的渠道以支持我的研究发现需求，并当做重要的起点。精确工具的使用和专业学科索引提高了查全率和查准率。

- 节省时间
- 紧跟领域新动向
- 找到搭档

工程学图书馆员

可以从多个出版商获取工程专业数据，这些数据是不断监管和更新的，覆盖了同类最佳的工程学科信息。

- 节省时间
- 为所有用户带来成功
- 培养与教职工和学生们的关系

Engineering Village和Knovel一起展示了一个整体集合如何跨越工程学校本科和研究生的科研和教学活动，给最值得信赖的技术数据传递了最新的突破思维，每个产品都能满足用户职场下的特定需求点。

信息的使用:常见问题解答

科研

协作和网络　　合成与分析

检索，发现，阅读，评论　　实验

- 什么是最新的趋势和技术?
- 研究之前有做过吗？我有哪些新的研究机会？
- 我的同行在做什么？
- 我如何写一个成功地投资提案?
- 我如何监控我的竞争对手?
- 如何找到我的合作伙伴?
- 如何快速获取我不熟悉领域的背景知识?

教学

准备课程资料　　审查和评分

鉴定主题　　分配支持工具

- 如何让我的学生参与/感兴趣?
- 如何保证学生们使用可信赖的信息资源?
- 如何教导学生写一份成功的研究论文?
- 如何教导学生解决实际开放式问题?
- 如何使学生对职场做好准备?

Knovel在使学术机构 工程信息需求上处于有利地位

科研

教学

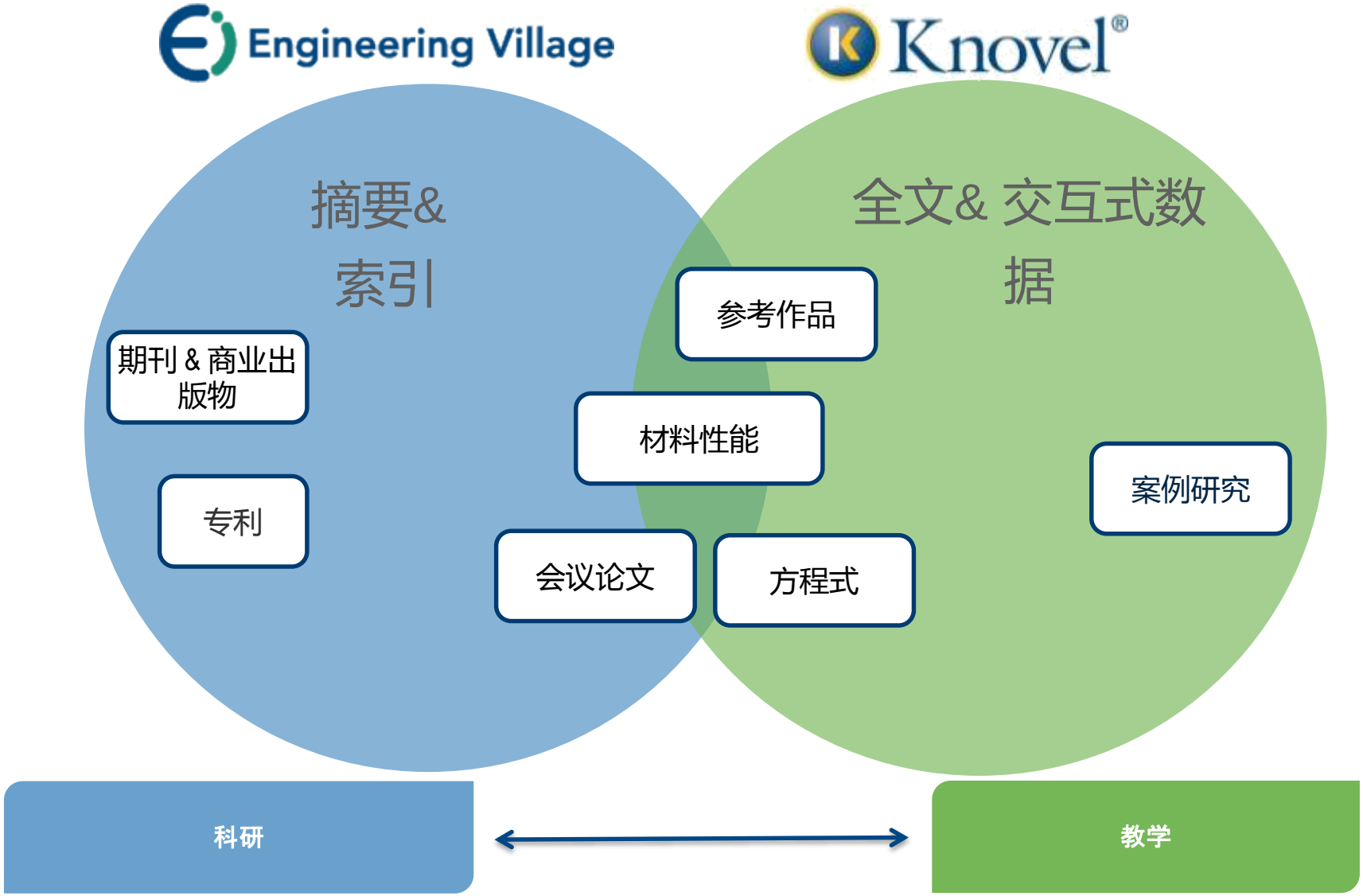
Knovel®

教授, 研究生, 工程学图书馆员

Engineering Village

教授, 研究生, 研究人员, 工程学图书馆员

Knovel 的核心价值



科研流程中产品应用

	研究计划	启动研究	进行研究
Engineering Village	• 确保研究方向的创新性 • 随时了解最新趋势 • 找到合适的背景 • 看看拟议研究相对于已经完成的工作将做出什么贡献 • 确定在该领域工作的其他研究人员/合作机会	• 寻找实验数据 • 查找并了解既定的研究和技术（内容广度） • 确定技术趋势 • 确保搜索最广泛的内容覆盖范围。 *“确保计划一旦执行，我们从EV开始，以确保我们没有错过任何东西。”*	• 识别竞争对手 • 避免重复工作或遵循错误的路径 • 认识到潜在的发展和许可机会 *“在我发表之前，我再次回顾EV，并祈祷没有人在过渡期间发表任何文章。”* *"……我们的很多项目都是多学科的。……他们出现在Compendex上。*
Knovel®	• 查找属性数据以查看属性数据是否存在或者是否已经执行了任何操作。 *“70%的时间我使用Knovel进行研究，这是在资助开发阶段，因为这是我需要了解问题的时候，我们正在查看已出版的教科书和程序手册。”* • **快速了解一个不熟悉的话题**	• 填补数据和知识方面的空白 • 让研究生快速上手。 • 引用已规范的数据，例如AASHTO标准。	• 查找特定计算的属性数据 • 找到一个比较，看看它是否与发布的结果类似，以验证选定的方法。 *“如果我正在进行实验工作，并且我已经获得了固体热容量的某些值，我会检查Knovel，看看是否有类似的信息。”*

教学流程中产品应用

	本科生	高年级本科生	研究生

Knovel	• 快速获取有关不熟悉主题的背景知识
	• 了解基础知识并确定在A＆I数据库中使用的搜索词
	• 数值检索-材料属性数据搜索
	• 依赖Knovel的示例类：
	  • 路面管理
	  • 土木工程材料
	  • 桥梁设计
	“我对学生进行了调查。 所有人都在使用Knovel。 他们只用几个关键词找到相关信息。“
		高级设计课程是Knovel最常用的用途之一：
		• 材料属性数据
		• 有关反应率，尺寸和经济性的数据
		• 有关用于项目和类似Capstone项目案例的设备的信息
		“学生们可以访问Knovel，找到他们设计化工厂所需的所有信息，包括物理属性和模板。”
			• 快速获取有关不熟悉主题的背景知识
			• 查找特定计算的属性数据
			“我们通常会要求研究生考虑将Knovel作为开始之一，然后再寻找其他地方，例如Engineering Village的研究论文。”

Engineering Village	• 信息素养：引用来自审查来源的科学文章 获取研究论文或课堂作业的信息。 加快学习领域的速度 了解最新发展，如新闻中的文章 提供搜索策略指导 • 提出修改建议 *“我们使用文章来审核正在进行的项目。 我们正在寻找有关化学工程或进展的信息。“*	当学生进入高年级学习后，他们需要访问教科书之外的信息。 • 在开发论文/研究报告时参考的可靠来源。 • 确定研究领域的趋势 • 跟踪其研究领域的发展进展	• 研究已发表的关于特定主题的内容并创建参考书目 • 找出文献中的新内容，或阅读经典论文，看看作者如何提出他们的理论和模型。

科研活动中，我们现在为用户解决了哪些需求和目标？

Dr. Richard Li,
教授
Mechanical Engineering

Jack Smith
研究生,
Engineering & Research Assistant

科研活动

选题

1 李博士确定了一种新的金属合金，并有兴趣探索其抗拉强度和对摩天大楼设计中框架结构的影响。他开始阅读Engineering Village中的文章。
李博士认识到，对这种材料及其用途进行研究可以为工程学院带来认可和企业研发资金。

3 受到Jack与他分享的结果的启发，李博士认识到有机会进一步研究。 他从政府和基金会拨款中获得了全部研究资金，并让Jack继续开始。

Jack和团队开始建模过程，使用Knovel识别，构建和测试他们的研究假设并确定他们的研究目标。

他们使用Knovel找到有助于此过程的特定材料属性数据和方程式，并减少所涉及的一些时间，重复和乏味。

建模

2 李博士找到杰克，请他收集更多地过去/现有的研究，实验或专利，以确认他不会重复他人的努力。

李博士还希望找到与同行就这一主题进行合作的机会。Jack调查了有关Engineering Village的这一主题的现有研究，并将这些结果发送给李博士。

4 随着研究即将完成，李博士在Engineering Village进行再次检索，以确保最近没有发表类似的研究。

设置邮件提醒以确保跟踪此领域中的所有新信息。

教学活动中，我们现在为用户解决了哪些需求和目标？

Dr. Richard Li,
教授
Mechanical Engineering

Tanya Sloane,
研究生,
Engineering

Randy Jones,
工科馆员

教学活动

课堂经验

1 Tanya参加了李博士关于其工程课程中桥梁结构和悬挂结构的讲座。

在讲座期间，李博士参考了特定桥梁的建造和修理，并指导他的学生在下一堂课之前熟悉这些结构，特别是参考在澳大利亚悉尼设计和建造的使用新型加固的创新桥梁。

在他的班级的Blackboard笔记中，他包括涉及桥梁及其技术属性的问题集。

课后经验

2 Tanya在课堂上做笔记，并自己使用谷歌获取一些一般信息，但为了准备上课，她需要找到更多关于桥梁的技术信息和数据。
她访问了工程图书馆并与兰迪合作，寻找最近发表的期刊文章，重点关注悉尼在Engineering Village的桥梁。
为了回答关于问题集的问题，Tanya使用Knovel找到用于构建桥梁的材料的适当数据。 她使用嵌入式工具执行“假设”分析并根据需要将数据集提取到Excel以查找问题集的解决方案。 数据会自动下载，并附有引用所需的所有引文。

3 Tanya节省了时间，使用和引用可信信息源完成了她的任务，熟悉了她在进入企业时将使用的工具

关于Knovel

- **没有其他的工程学平台能提供Knovel 今天所能提供的先进的互动性和数据检索:**
  - 为工程师进行优化.
  - 高性能的检索保证内容可以被发现–这些发现能转化为更好的采纳并促进发现.
  - 超过10万的交互式图形, 图表公式
- **Knovel 是教学和科研的资产:**
  - 教授可以鼓励学生运用多种资源和工具来解决一个有宽度的现实问题.
  - 教授可以检查学生对于资料的理解力, 形成对核心原则更深入的了解
- **Knovel 帮助培养下一代工程师**
  - 学生将使用在全球范围内领先的公司的工程师所使用的相同的研究工具和值得信赖的信息, 为成为有竞争力的员工做好准备。

"鉴于其满足用户需求的能力和快速而有效率的服务, Knovel已经成为其目标用户群体的黄金标准."

- "STM 电子图书: 2012 市场规模, 占有率, 和前景" by Laura Ricci

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2012-2013 EContent 100

卓越的 学术客户名单

- 全球成千上万的工程师和工程学学生使用Knovel
- 世界最佳工程技术大学前20名中的14所
- 历史年度续签率达90%以上

地区

- 中国科学院
- 清华大学
- 上海交通大学
- 香港大学
- 香港科技大学
- 华中科技大学
- 同济大学
- 天津大学
- 重庆大学
- 高科联盟

University of California Berkeley
Princeton University
Cornell
McGill
UCL
Stanford University
Carnegie Mellon
The University of Sydney
The University of Hong Kong
Queen's University
METU
The University of Melbourne
Nanyang Technological University
Imperial College London
Virginia Tech
MIT Massachusetts Institute of Technology
University of Waterloo
香港科技大學 The Hong Kong University of Science and Technology
Manchester 1824
Yale University

*资料来源 – 2013-2014年泰晤士高等教育世界大学排名“工程与技术”类

卓越的 企业客户名单

- 全球成千上万的工程师和工程学学生使用Knovel
- 世界500强企业中的74个
- 历史年度续签率达90%以上

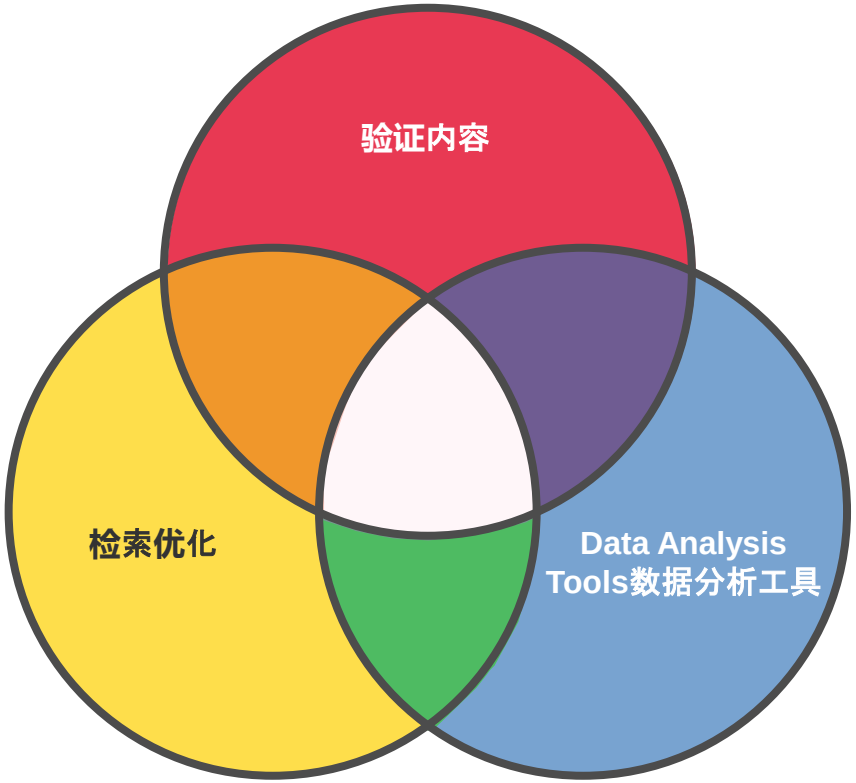
- “十大”在石油和天然气，精细化工，航空航天与国防和工程设计与施工领域的工程公司

全球

amec
TETRA TECH
3M
FLUOR
Husky
DOW
BARRICK
Shell
bp
HUNTSMAN
HATCH
CATERPILLAR®
DUPONT
ExxonMobil
BOEING
ARUP
ALCOA

Knovel 解决方案: 三个关键要素整合

Knovel是一种基于网络的专业在线工程平台，将技术信息集成于分析与搜索工具，致力于推动创新，为工程师提供值得信赖的答案。
用户将Knovel视作可靠的一站式技术参考，包括资料属性数据。他们向Knovel而不是某一本电子书寻求答案。在Knovel的海量工程资源中快速寻求答案，同时与原本静态的数据互动，这种特点使Knovel远远超越了整套电子书的价值。



来自相关渠道的可信内容

权威内容

- 来自被承认的团体与出版合作者的已被证实的、公认的科学资源；
- 由客户需求驱使的严格甄选过程，由行业专家审核；
- 编辑顾问委员会提供了深厚的工程经验与领导，确保内容的深度和广度，以满足客户需求；
- Knovel 的关键内容是独有的且高度互动的。

AASHTO美国州公路和运输观员协会	DECHEMA德国化工与生物技术学会	National Ground Water Association美国地下水协会
AIA美国航天协会	FASEB美国实验生物学联会	PMI国际项目管理学会
AIChE美国化学工程学会	IFIS国际食品信息服务	RSC英国皇家化学学会
AMACOM美国管理协会	IABSE国际桥梁与结构工程协会	InternationalSAE国际自动机工程学会
AOCS美国油脂化学学会	IChemE化学工程师学会	SIAM美国工业与应用数学学会
ASHRAE美国冷冻空调协会	IET国际工程技术学会	SME矿冶与探测学会
ASME美国机械工程协会	ISA国际自动化协会	SNAME美国造船暨轮机工程学会
ASM International美国材料信息学会	IOP英国物理学会	SPE国际塑料工程师学会
AEE美国能源工程协会	TMS美国矿冶与材料学会	SVC美国真空镀膜协会
ASTM International美国材料试验协会	NACE International美国防蚀工程学会	SPIE国际光学工程学会
AWWA美国水行业协会	NCRP 美国辐射防护与度量委员会	TRB 美国运输研究委员会
		WEF水环境协会

为工程师优化检索

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为工程师优化检索

- 查找隐藏在表格，图表和方程式中的数据
- “理解”工程学语言
- 自动进行单位换算
- 允许数值范围检索
- 进行多变量检索

数据分析工具 集成到工程学工作流程中

权威内容

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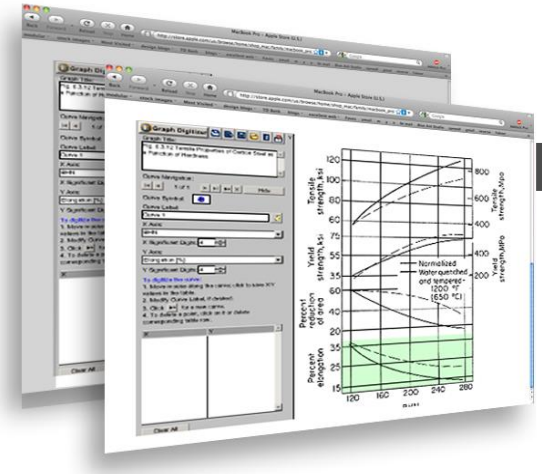


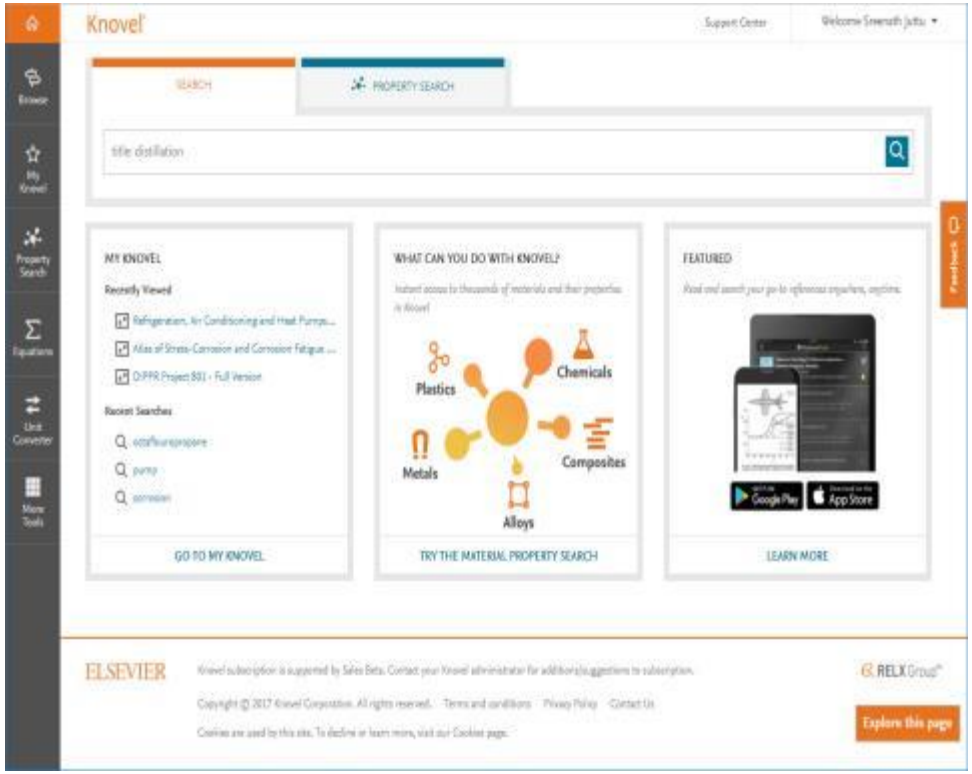
数据分析工具集成到工程学工作流程中

- 对于初始计算和信息验证易于使用的工具
- 超过10万的交互式表格，图表和方程式
- 像分类电子表格一样轻松地自定义和操作数据
- 通过在图上绘点数字化一个或多个曲线
- 保留格式和文件数据源的同时能简单地将数据导出到Excel表格

它如何工作？

从年轻工程师……

……到行业资深人士……



……来：

- 建立基础知识

并

- 解决工程问题

……通过Knovel的：

- 基本答案
- 加速发现
- 持续访问……

Knovel能够提供：现实生活例子

背景

约翰是一家全球化学品制造商的资产完整性工程师，负责一条生产线。

最终产品是一种平衡溶液，成分包括乙酸、过氧化氢、多种稳定剂、一种催化剂（矿物酸）以及过氧乙酸。

挑战

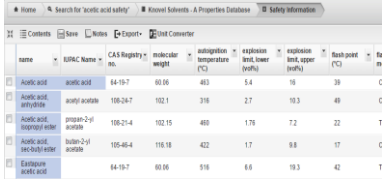
在工艺中增加了一个最终产品的储存罐。

几个月后的定期安全检查发现储存罐的腐蚀速度出乎意料的快。

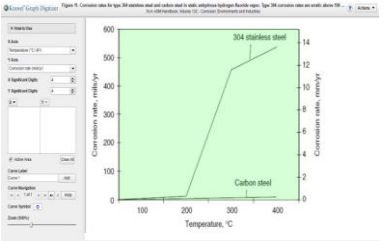
如果这个问题得不到解决的话，这将带来：

a. 安全担忧，以及
b. 产品质量问题（腐蚀的金属与产品混合）

解决方案 - Knovel在行动



工程师使用Knovel理解了储存罐不寻常的腐蚀情况，识别了腐蚀问题的根源。



Knovel帮助识别了温度等可能影响工艺的风险因素，最终将储存罐移动到了阳光照射不到的地方，从而避免温度过高。

影响

通过解决腐蚀问题，这提升了工艺安全性，帮助保持了产品质量。

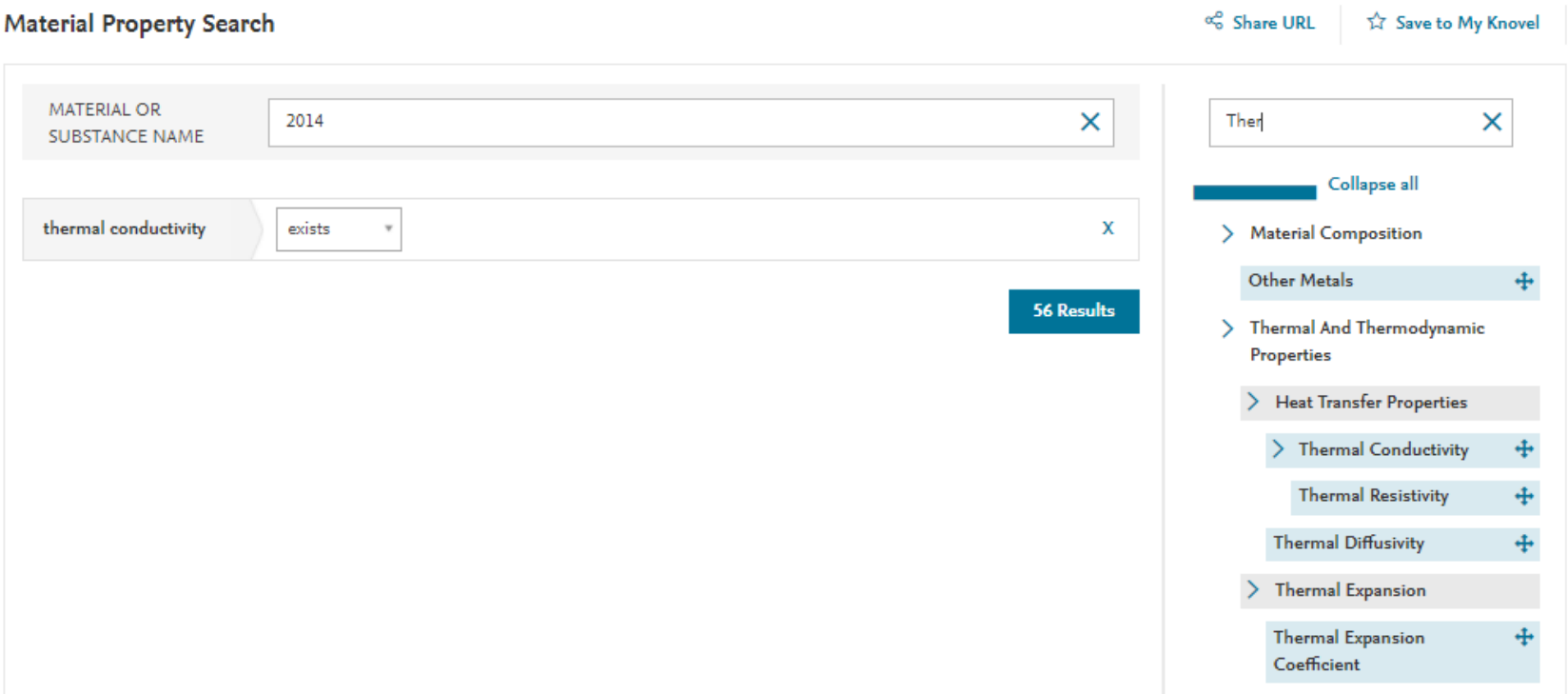
按每升1.25美元计算，这三个储量5万升的储存罐对每批产品的影响超过15万美元。

Knovel能够提供

	基本答案	加速发现	持续访问
什么 >>>			
如何 >>>	来自超过140家值得信赖的提供商的内容 通过交互式方程式、图表和工具提供问题解决能力 广泛的材料属性数据	理解工程语言的搜索能力 基于分类学的搜索过滤，是一个很好的工程概念学习工具	移动应用程序：下班后也能访问 软件插件（AutoCAD、Inventor、Excel） 增强的可发现性，例如EBSCO、SUMMON、PRIMO
帮助 >>>	 **学生：** • 学习：建立基础知识，在课程中表现出色 • 准备：合作教育/公司实习/未来工作，使用行业工程师所使用的工具		 **工程科研人员：** • 实现正常运行时间最大化，降低成本，降低工程风险 • 开发新工艺或改进工艺 • 满足合规和监管要求 • 提高知识支持以及可采取行动数据的可及性

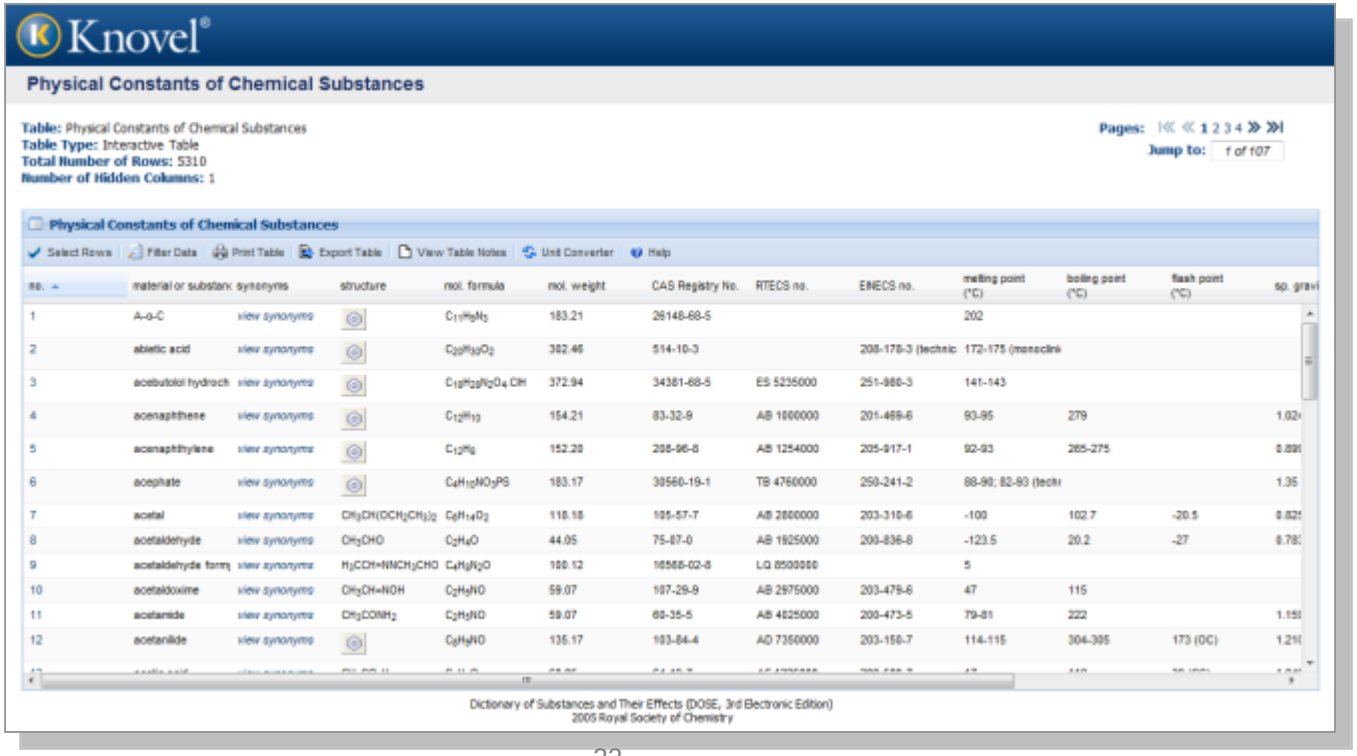
功能特色-数值型检索

- **Knovel数值型检索**：根据工程师的思维方式以及搜索需求而设计。用户可以搜索数字类型的关键词或数据。Knovel还能够以表格、图表和方程式的形式返回搜索结果。



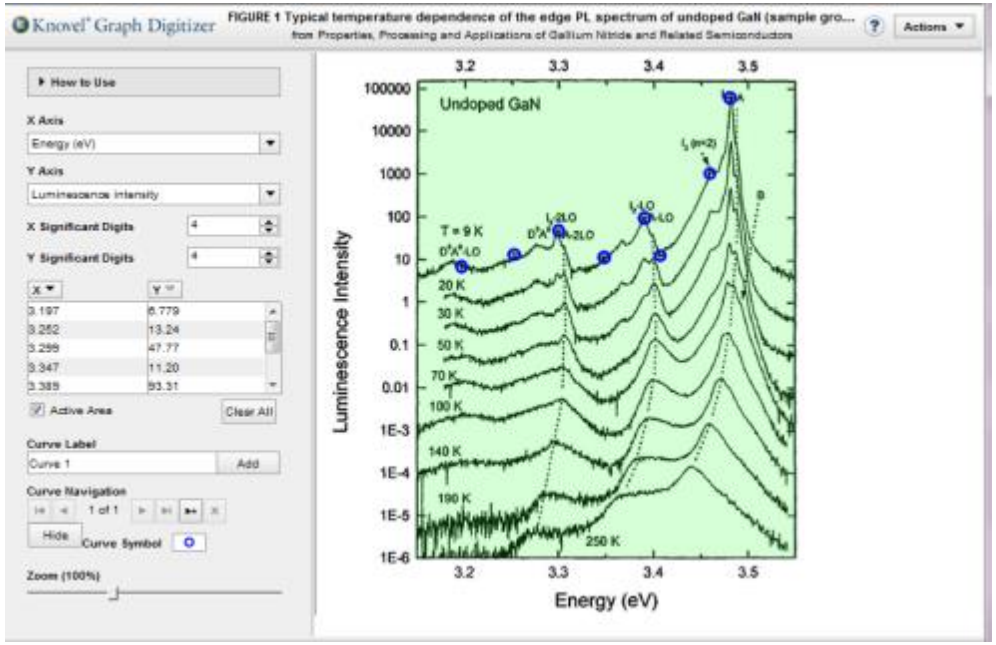
功能特色-交互式表格

- **Knovel交互式表格**:让您可以随意变动行或列的排列、可隐藏选择的行列数据让相关数据有最佳的呈现、或将数据汇出。而Knovel更期望其使用者可将汇出的表格作为引用证明的数据来源。



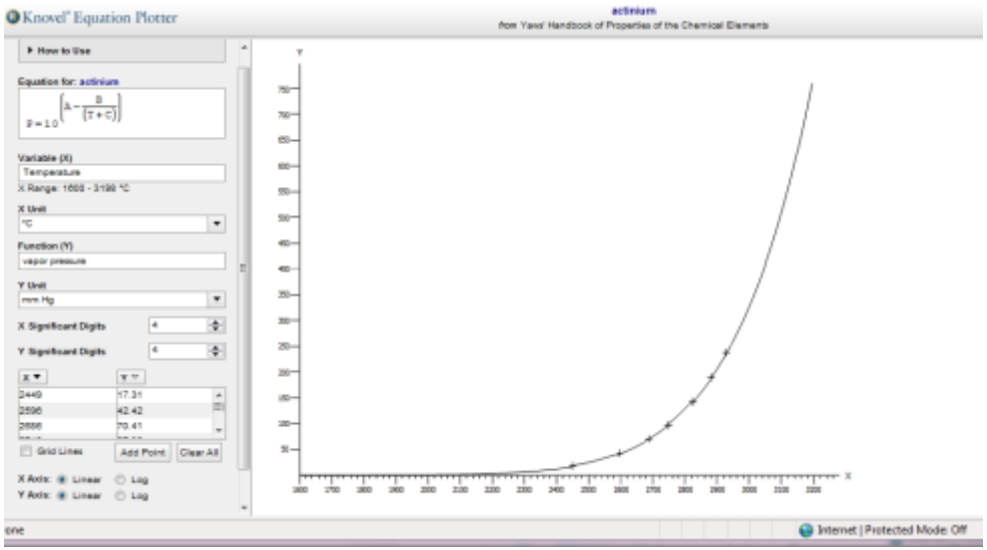
功能特色-交互式图表

- Knovel交互式图表：**可让您测定精确的数据坐标而不用依赖易出错的推断技术。所有相关数据皆可输出以协助您决定并且对于后来的同侪评审来说是一个很好的引用资源。**

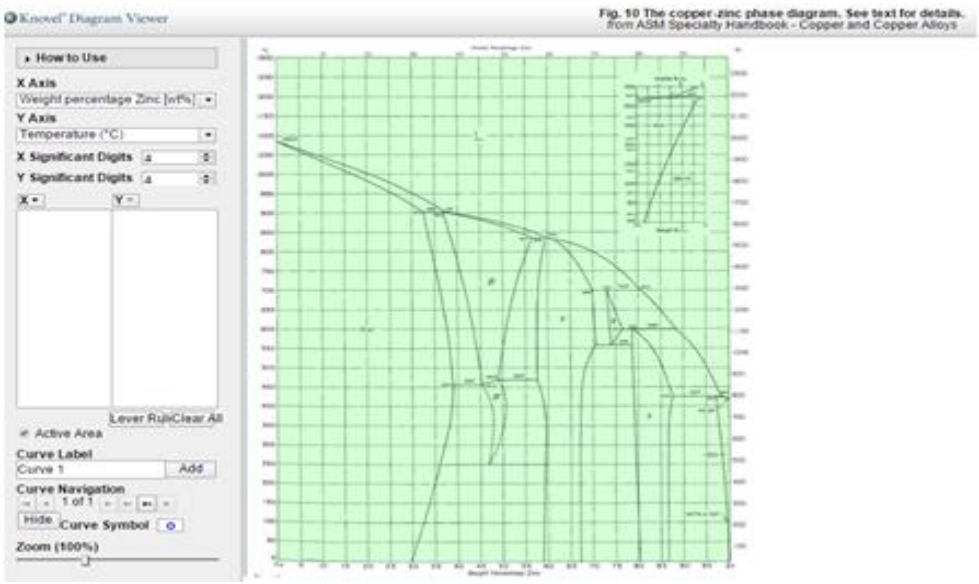


曲线数字转化器——可以将静态的曲线数据汇出，也可以将数据在图上标绘出来、汇出、打印。

功能特色-交互式图表



方程式标绘器 —— 根据方程式进行绘制曲线图，您可以在图上进行描点，标注及改变坐标单位等操作。



相图阅读器——可确定两相系统的边界组分，内置杠杆原理计算器。

功能特色-互动式方程式

包括超过500个实用方程式，使用内置的方程求解计算，并导出计算报告和分享知识；并结合文字，数学，图像和情节以便捷地一键式的工程公式功能，访问包含数学函数，工程单位，编程结构，以及数学符号工具箱等。

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Covers analog circuit design, electromagnetic compatibility, MEMS, RFID, the use of lithography and microlithography in IC and microchip fabrication, vacuum coating methods, electro-optical devices, and silicon and other semiconductor properties. Of use to electrical, electronics, manufacturing and optical engineers designing electronics, manufacturing processes, packaging methods, and testing regimes. Includes a collection of Knovel Equation Solver interactive equations.

AC Equivalent Resistor of LLC Converter

+ Add to My Knovel

This equation gives the AC equivalent load resistor (also called the reflected load resistance) of an LLC converter. The secondary side of an LLC converter sees an AC current and voltage input, and so it is more reasonable to use the AC equivalent model to analyze the circuit. The AC equivalent resistor could be used in LLC converter modeling.

Amplitude Modulation Ratio (Bipolar SPWM Control)

+ Add to My Knovel

For the DC-AC application (inverter), people use the sinusoidal PWM (SPWM) method to generate the control signal. It uses a high-frequency triangular wave in comparison with desired pure sinusoidal waveform. It generates a PWM signal with a varying duty cycle. average of the output will follow the sinusoidal waveform. The frequency of the triangul waveform establishes the inverter switching frequency, fs, and is kept constant along wi amplitude, Ac; fs is also called the carrier frequency. The control signal (desired wavefor has a frequency, fl; fl is also called the modulating frequency. Note that this equation ap to bipolar SPWM modulation.

Boost PFC Inductor Design

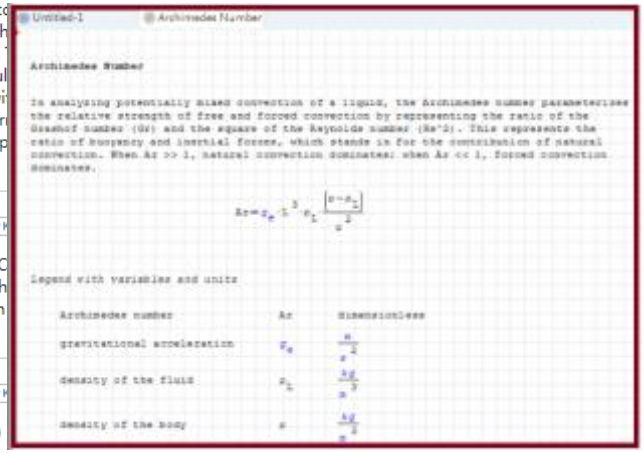
+ Add to My K

This equation gives the inductor value of a boost PFC converter. For the ideal boost PFC (power factor correction) converter, we assume that there are no losses in the circuit. Th inductor is generally sized to get a desired current ripple. Note that the inductor design valid only for a CCM (continuous conduction mode) boost PFC converter.

Boost PFC Output Capacitor Design

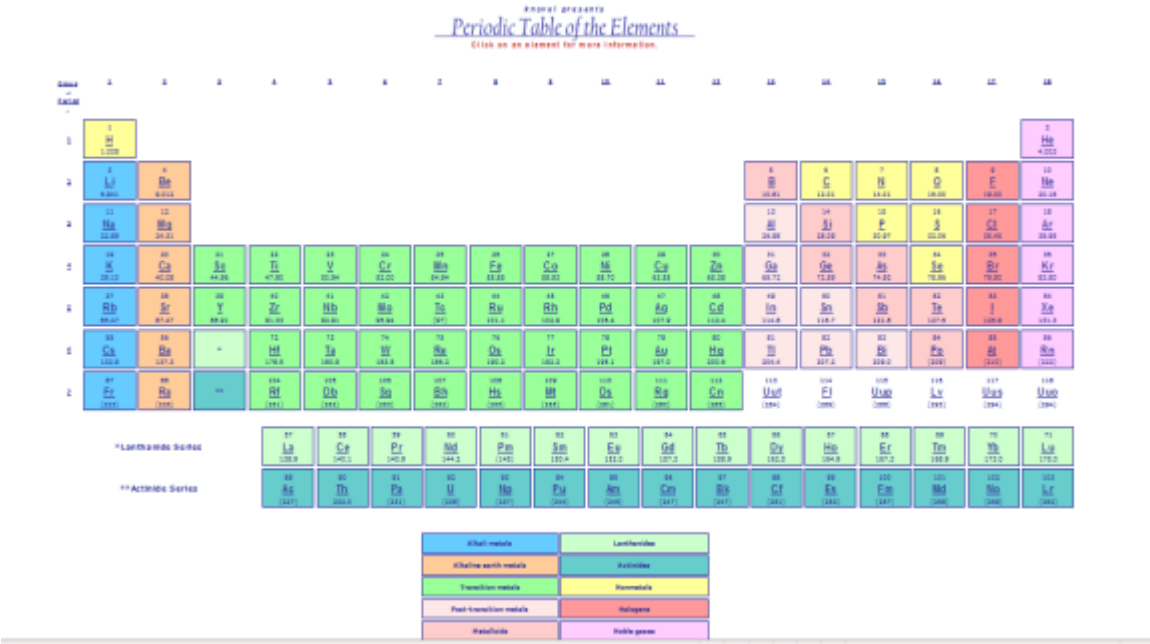
+ Add to My K

This equation gives the output capacitor value of a boost PFC (power factor correction)



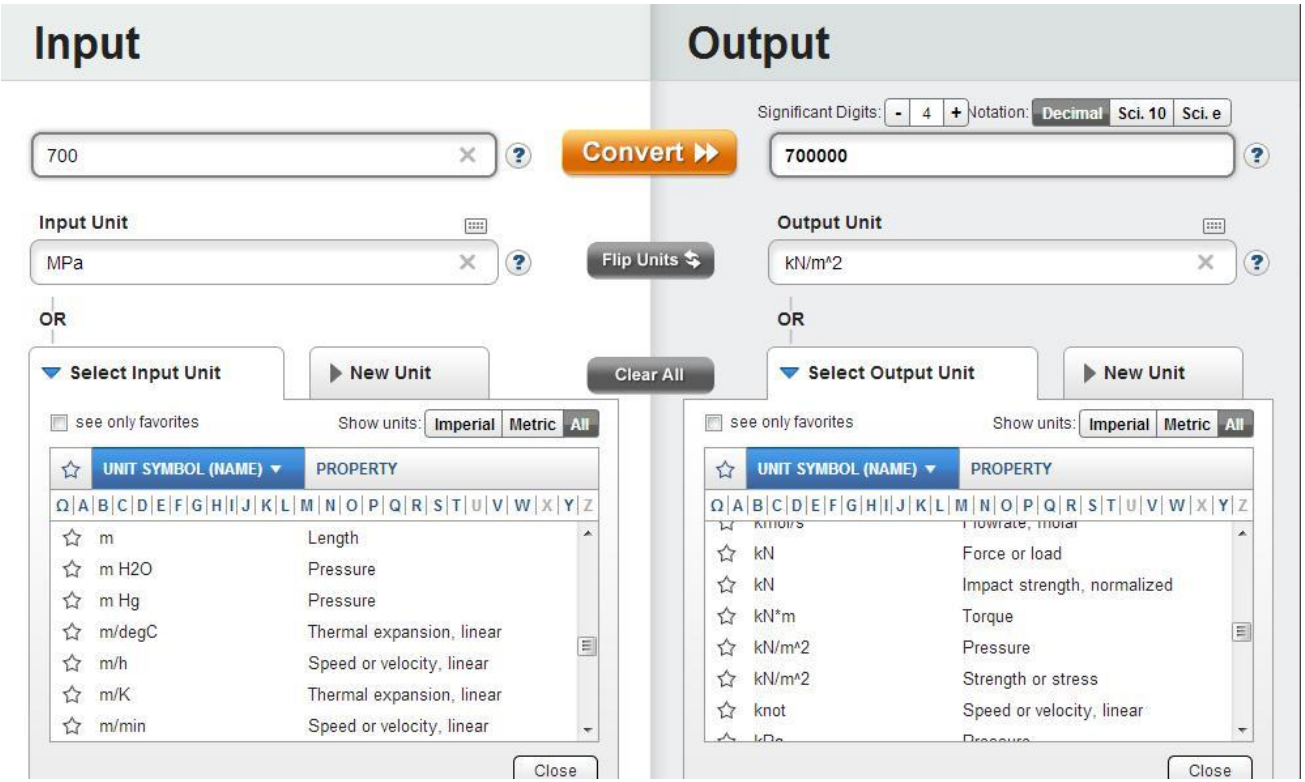
工具-元素周期表

提供了各个化学元素的信息，包括：原子质量，电子结构，化合价，同位素组成和其它常用理化性能参数。



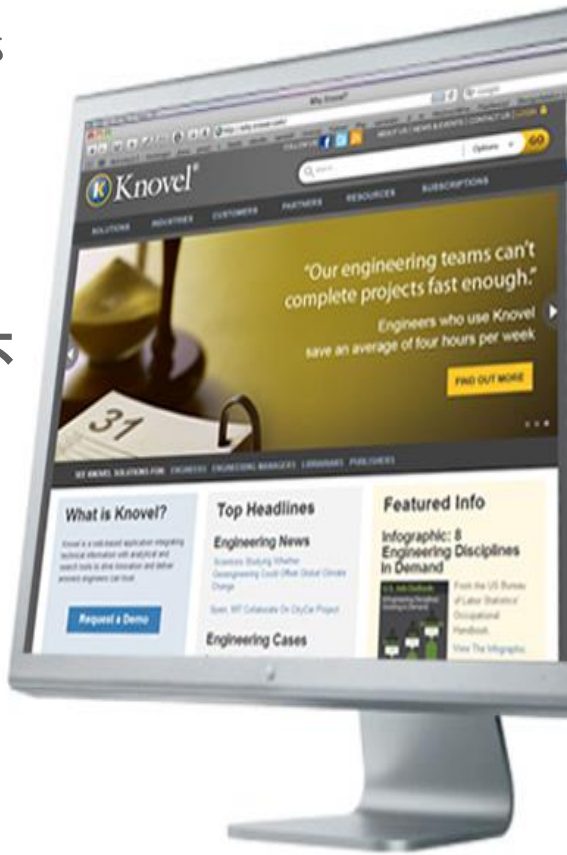
工具-工程单位转换器

Knovel单位转换器有两种模式可供选择。非订户获得免费使用的和共享的工具能够访问约1,000内置单位为超过80的工程运算使用。Knovel用户拥有额外的定制功能。它们可以保存和访问用户创建的单位，标记和排序自定义的单位，并创建自己的默认设置。



科研人员如何评价Knovel

- 是**与谷歌相比**快速找到相关答案的**更好的选择**
- 是用以确定材料具体用途的材料性能数据的转向资源，没有任何其他资源提供如此方便、准确的访问途径
- 拥有交互式表格，图表和方程式，使数据“**活起来**”；帮助学生了解一个变量如何影响另一个
- 向学生介绍**现实世界的问题**，这些在标准教科书中是学不到的
- 是学生必须处理真实数据的**高级顶层设计过程中必不可少的工具**，
- 有利于创造所有学生可以同时访问的阅读书目.



用户反馈

“与其使用谷歌等搜索引擎获得原始数据甚至没有数据，学生们更愿意使用Knovel 在几分钟内获得相关结果，帮助他们解决职场中遇到的实际问题.”

- Dr. Vladimir Genis,
应用工程学副教授与项目主任
德雷赛尔大学

“使学生和教职工能够远程访问大量重要的参考信息，提供同时搜索广泛相关资源的能力，使得他们的研究更加高效和高产。”

- 路易斯安那州立大学

“我们把Knovel应用到我们的课程中，因为我们的许多学生无疑会在进入职场后遇到它.”

- Dr. Robert Malloy,
材料工程学院教授与主席
马萨诸塞大学洛厄尔分校

“Knovel is the first place we go to answer chemistry, engineering, and materials related questions. I almost always find what I’m looking for because I’m able to search across so many different sources and I know that the sources within Knovel are of high quality and reliable.”

- 化学与化学工程图书馆员，
明尼苏达大学

“自从学习Knovel后，我在寻找和验证资源上花的时间变少了，就有更多的时间来学习重要课程，这就是我在学校所做的.”

- 康纳尔大学生物工程学生

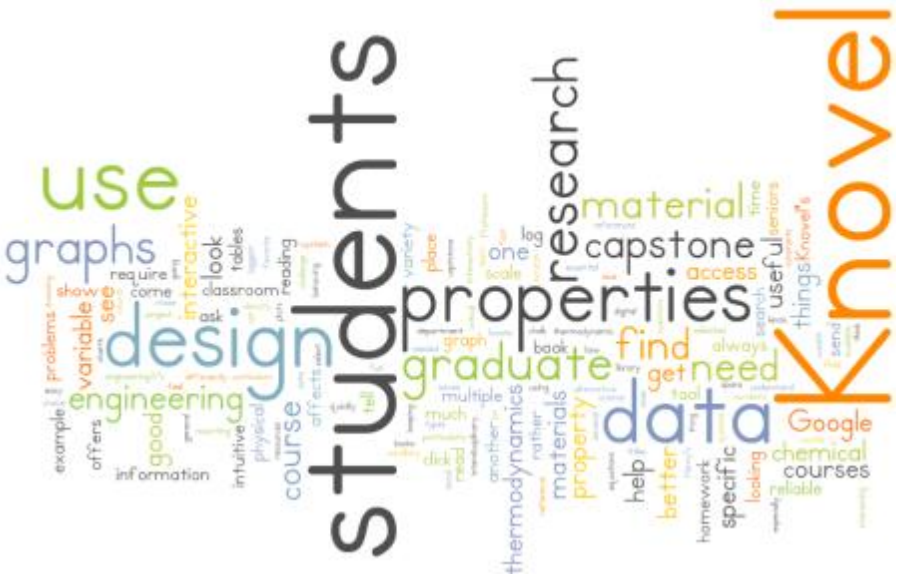
学术机构面临的挑战

挑战

- 教导学生如何处理现实世界的开放式问题
- 开发新的课程或保持课程的更新
- 教导学生在研究中不要过于依赖谷歌和维基百科
- 培养学生的信息素养和解决问题的能力
- 帮助学生在大量资源中找到正确答案和数据点
- 整合对于学生来说成本不那么高昂的资源

打造极品

- 易于在线访问，值得信赖的资源
- 学生在职场中解决问题所需要的资源
- 使寻找工程学数据更为简单的工具
- 学生能免费获取的信息资源
- 可获取材料性能数据
- 提供最新的内容

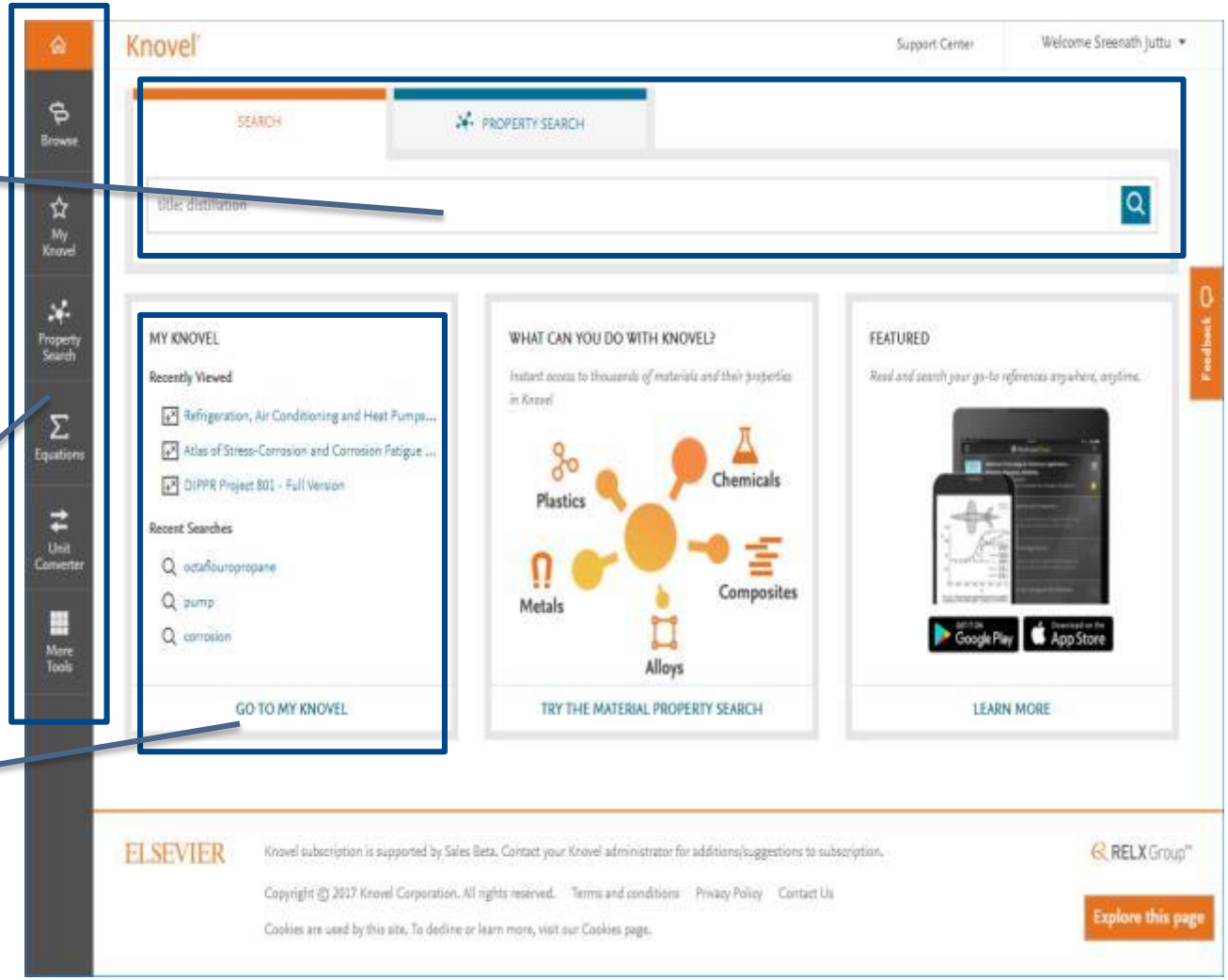


了解Knovel：首页

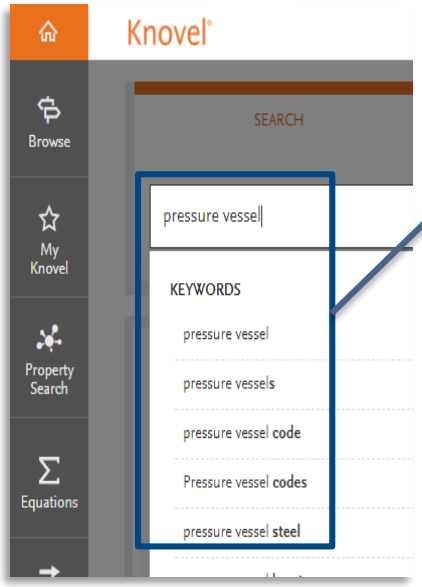
搜索栏让用户能够很方便地访问Knovel上丰富且经过验证的分类内容

Knovel的所有工具，其中包括交互式内容和材料属性搜索，都可以通过“持续的”工具栏轻松访问

“我的Knovel”将显示用户最近的搜索和活动，提供个性化的体验

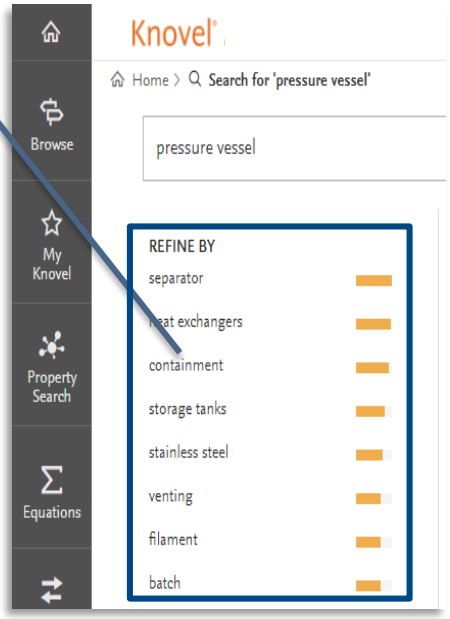


了解Knovel：搜索

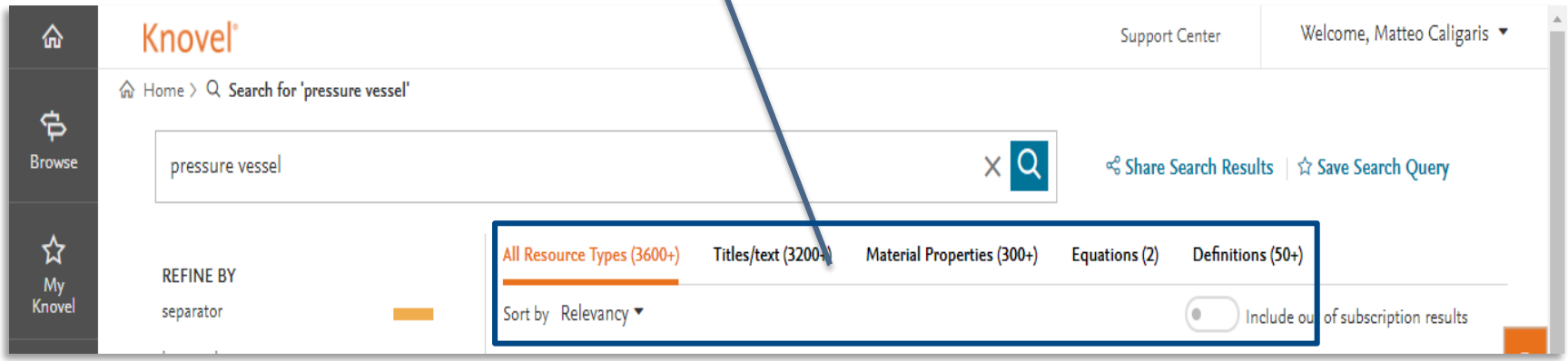


自动建议：Knovel将建议与工程话题最相关的搜索

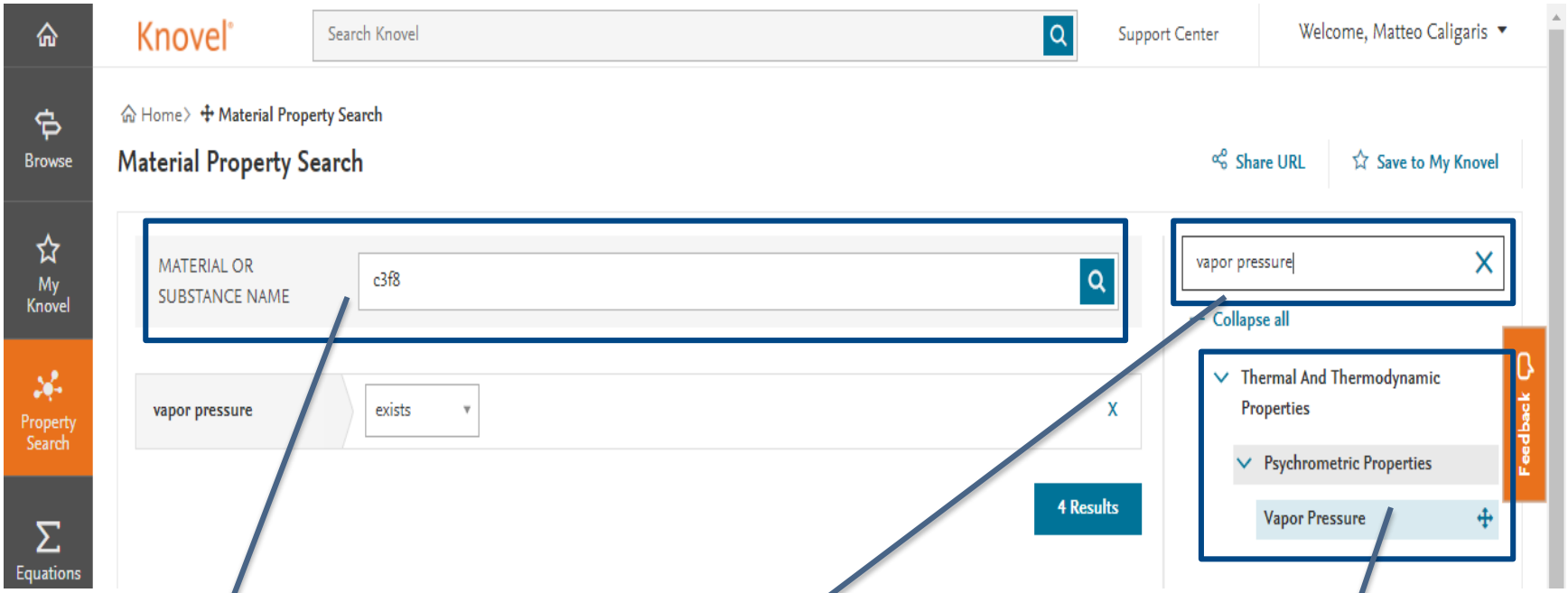
搜索结果可以根据工程概念进行细化，帮助过滤用户所需的结果



搜索结果可以根据内容类型进行分类，让用户快速找到所需的信息类型



了解Knovel：材料属性搜索



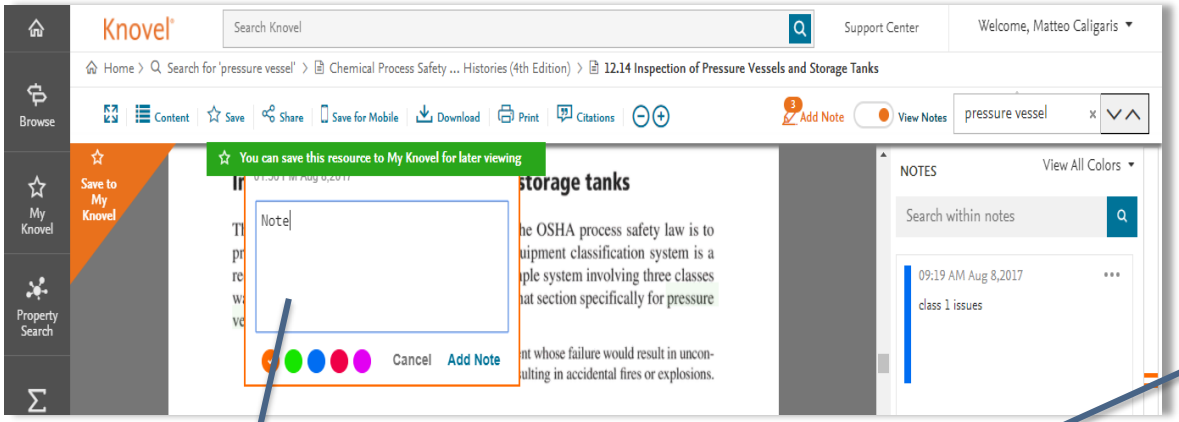
通过理解工程语言的专用智能搜索对材料或物质进行搜索，例如“H2O”或“水”

搜索并找到特定材料的属性或找到满足特定属性的材料

简单易用的拖放功能，让用户快速找到所需的数据

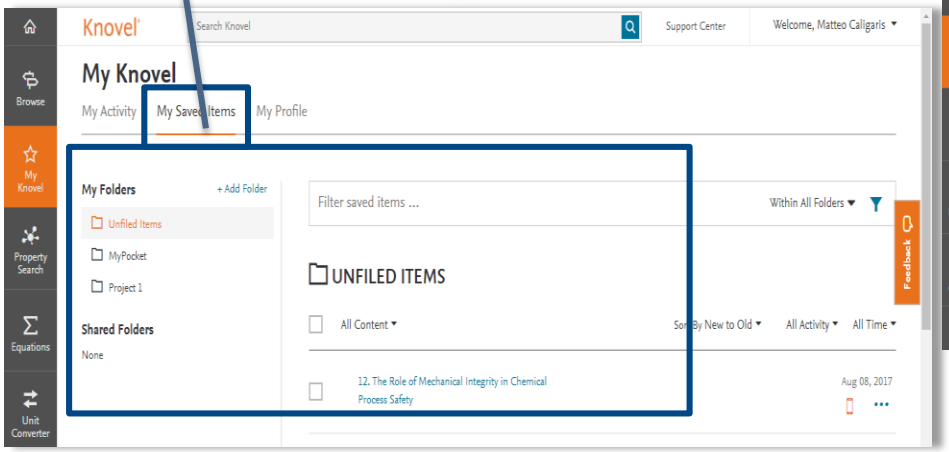
了解Knovel：个性化体验

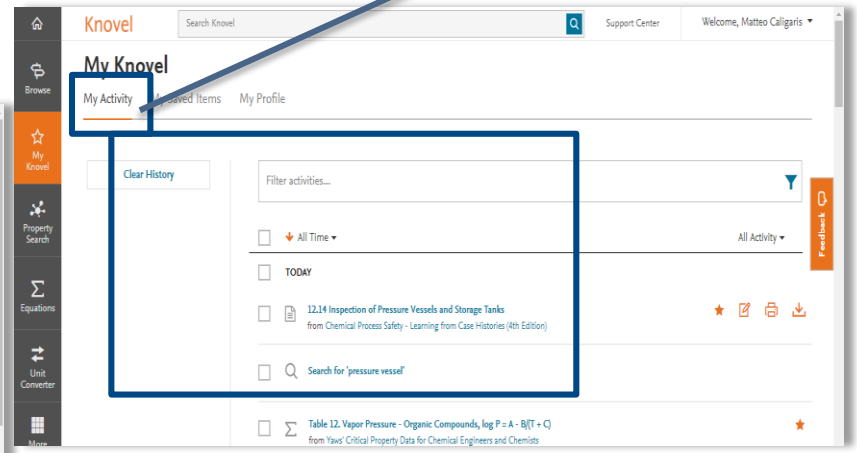
将最常需要的内容、笔记和数据保存到“我的Knovel”中



阅读、注释、保存和分享内容

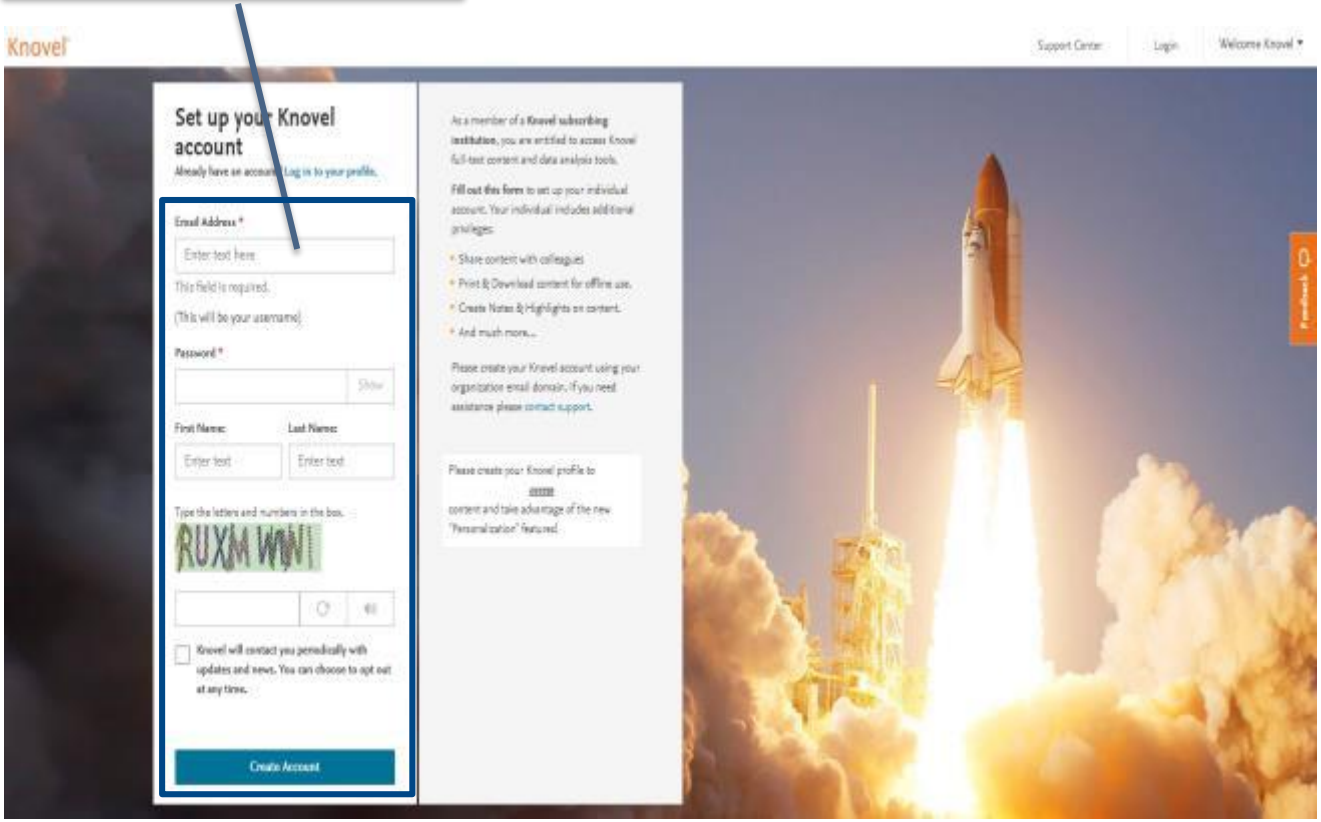
继续上次的搜索之旅





了解Knovel：注册

即刻访问：即刻开始使用Knovel，无需等待电子邮件确认**



为什么注册？

个性化：
保存搜索和活动，节省时间

移动访问：
通过适用于智能手机和平板电脑（iOS/安卓）的My Knovel To Go应用程序在路上访问内容

做笔记：
对内容进行注释，方便回顾、搜索和分享

**注：用户注册后可以即刻访问Knovel，可以在获得访问权限后的两天内完成电子邮件注册

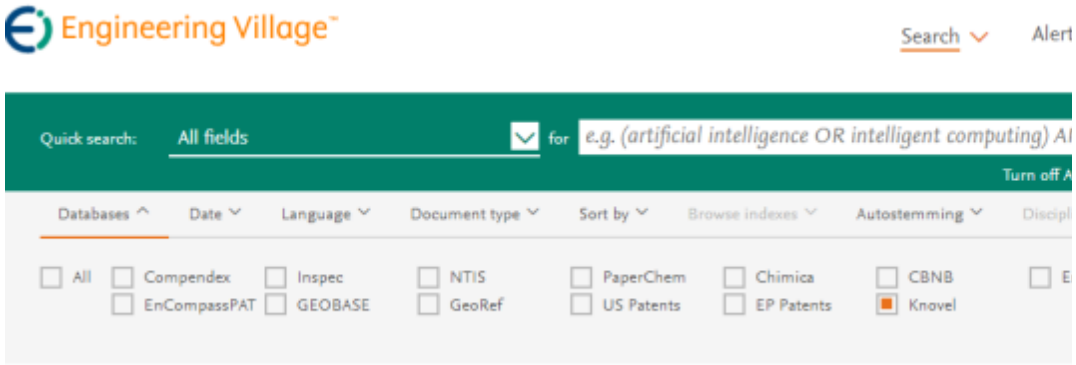
场景一：教学

教师在准备课程教案时总是需要更新内容，保证与时俱进

例如：准备向同学介绍关于‘机器学习’的相关内容时，教师往往需要阅读大量中外文的书籍、综述类文献，准备最紧跟时代的教案；并且希望启发同学的自主阅读和查找文献的习惯

英文关键词：machine learning

Knovel 为您提供与Ei数据库无缝链接的：参考书籍，相关章节，会议文章，教学案例和书籍中提取定义



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- perceptron
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- cross-validation
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Author(s) / Editor(s): Bonaccorso, Giuseppe

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- Front Matter
- Preface
- Table of Contents
- 1. A Gentle Introduction to Machine Learning
- 2. Important Elements in Machine Learning
- 3. Feature Selection and Feature Engineering
- 4. Linear Regression
- 5. Logistic Regression
- 6. Naive Bayes

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[CHAPTER] 9.1.2.1 Machine Learning ☆ Save Result
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...Machine learning Machine intelligence Machine consciousness Before getting into the details of each stage of AI, refer to Figure 9.4: Figure 9.4: Stages of AI (Image credit: https://cdn-images-1.medium.com/max/1600/0*aefkt8m-V66Wf5-j.png)... More

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with this demand, SARs need to be able to adapt to their environments and use prev

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...2.4.1 Machine Learning Machine learning is a topic that has captured the imagina

Preceding Part (6 of 22)
"Table of Contents"

1

A Gentle Introduction to Machine Learning

In the last few years, machine learning has become one of the most important and prolific IT and artificial intelligence branches. It's not surprising that its applications are becoming more widespread day by day in every business sector, always with new and more powerful tools and results. Open source, production-ready frameworks, together with hundreds of papers published every month, are contributing to one of the most pervasive democratization processes in IT history. But why is machine learning so important and valuable?

Introduction - classic and adaptive machines

Since time immemorial, human beings have built tools and machines to simplify their work

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[CONFERENCE PROCEEDING] Prediction of Process Window for Plastic Injection Molding Using Simulation Tools and a Support Vector Machines Classifier

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...comparison of supervised learning algorithms, in Proceedings of the 23rd international conference on Machine learning , ACM: Pittsburgh, Pennsylvania. 161-168 (2006). 11. P. Zhao, H. Zhou, Y. Li, and D. Li,... More

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[CONFERENCE PROCEEDING] A Study of Using Internet Technology to Improve Learning Efficiency of Learning Injection Molding Technology

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...of polymer materials; (4) structure of injection mold and (5) shooting trouble solving. And avoiding operate the real machine , we designed the virtual reality machine of injection molding... More

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[CONFERENCE PROCEEDING] Challenges in Teaching E-Learning Courses for Plastics Engineering Technology

...mechanisms, technology courses can be effectively offered to students in an online setting. There a themselves to an online format, such as those that contain lab sections, but some labs or portions or

See Inside

Learning Efficiency Test

The main propose of learning efficiency test is to prove whether the system has learning efficiency. The learners fill in the basic information for them, and proceeding the pre-test quiz. At the same time, LMS would record these information in the database.

After that, the learners proceed the learning about the courses of injection molding. After the learners learning the courses, the learning system would be shown the post-test quiz.

Discussion

From the experiments of the learning efficiency test, we used the paired samples t-test and independent samples t-test to analyze the results of the experiment through the SPSS software. The results have two parts: the paired samples t-test, and the independent samples t-test. About the results, we designed that all learners is "ALL", the learner that learned the correlation courses is "Y", and the learner that never learned the correlation courses is "N".

Paired Samples T-Test

According to table 2, we could get the result that t-value is -14.182 and p-value was smaller than 0.05.

From fig.10, the mean score of the "ALL" had an increasing trend. Through the e-learning system learning, the mean score of pre-test and post-test was statistically significant ($p = 0.000$), indicating that the knowledge of the e-learning system had a significant effect on the learning of these learners.

Table2. Paired samples t-test for "ALL"

Through the paired samples t-test for "Y" group, we can get the result that the mean score of pre-test and post-test for Y group was statistically significant ($p = 0.000$), is shown in table3. The knowledge of the e-learning system had a significant effect on the learners of "Y" group. The mean score of post-test was clearly higher than the mean score of pre-test, is shown in fig.11.

Table 3. Paired samples t-test for "Y" group

	Sample	Mean Score	Standard Deviation	t-value	p-value
Pre-Test	17	37.06	17.946	-8.468	*0.000
Post-Test	17	80.59	14.349		

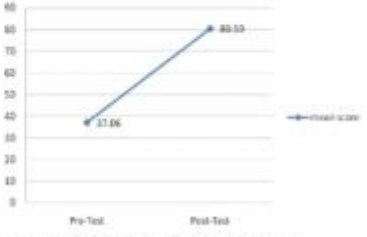

Figure11. Variation of mean score for "Y" group

For the learners of "N" group, through the paired samples t-test, indicating the knowledge of the learning system had a significant effect on the learnings of these

定义-快速发现可靠的定义

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[ENCYCLOPEDIA] **Machine Learning Approach** Save Result

From International Encyclopedia of Ergonomics and Human Factors, Volume 1 (2nd Edition) (2006)

...MACHINE LEARNING APPROACH Machine learning refers to algorithms that automatically learn (i.e. set tuning parameters) based on experience or training data. Two very popular methods in the area of machine learning are decision trees and artificial neural networks. When compared to the methods of statistical approach, these two can be characterized as model... Less

[ENCYCLOPEDIA] **BN Learning**

From Encyclopedia of Statistics in Quality and Reliability, Volumes 1-4 (2007)

..., known as structural EM, that presumably converges to a local maximum of the BIC score [7, 13]. Probabilistic Models It is well known that classic machine learning methods like Hidden Markov mo and Kalman filters can be considered as special cases of BNs [4, 13] Specific types of BN models we

as solving the classification, regression, and clustering problems, even though there are other categories of tasks that the data mining methods can be applied to: summarization of data and deviation detection; problem-solving, and knowledge-engineering tasks (Moustakis *et al.* 1996).

It is difficult to draw the precise boundaries of data mining because it is basically interdisciplinary, reaching into statistics, database technology, machine learning, pattern recognition, artificial intelligence, visualization, and other knowledge discovery techniques. In later sections, some of the major data mining methods are reviewed from the machine learning and statistical approaches.

3 MACHINE LEARNING APPROACH

Machine learning refers to algorithms that automatically learn (i.e. set tuning parameters) based on experience or training data. Two very popular methods in the area of machine learning are decision trees and artificial neural networks. When compared to the methods of statistical approach, these two can be characterized as model (or distribution)-free methods. However, even though decision trees and artificial neural networks are known as the methods of machine learning, some of those methods were also developed as statistical methods.

3.1 Decision Trees

Decision trees represent the decision rules, which partition the data (or the feature space) into a set of groups (or a set of rectangles) with hierarchical and sequential structures. A decision tree is said to perform classification or regression according to the types of the class labels (i.e. categories or dependent variables). Decision trees are called classification

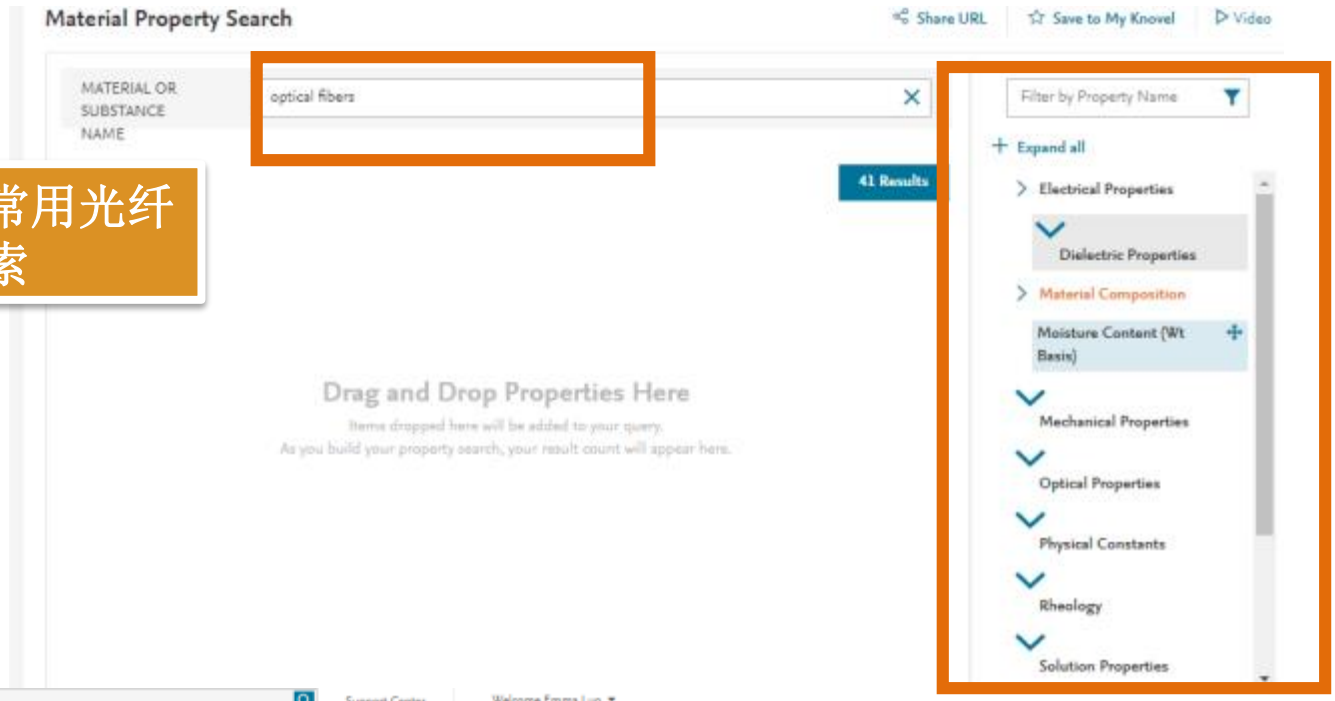
instability of trees, and inadequate crisp decisions, several new methods, such as soft splits, bagging, and boosting, are introduced to decision tree research.

Even though decision trees have some limitations, it is still an attractive and powerful method. Gehrke (2003) summarized the major advantages of decision trees. First, decision trees are easy to understand because they were inspired by the human decision processes. Second, decision trees are nonparametric and thus especially suited for exploratory knowledge discovery. Third, decision trees can be constructed relatively fast compared to other data mining methods. Fourth, the accuracy of decision trees is comparable to other classification models.

3.2 Artificial Neural Networks

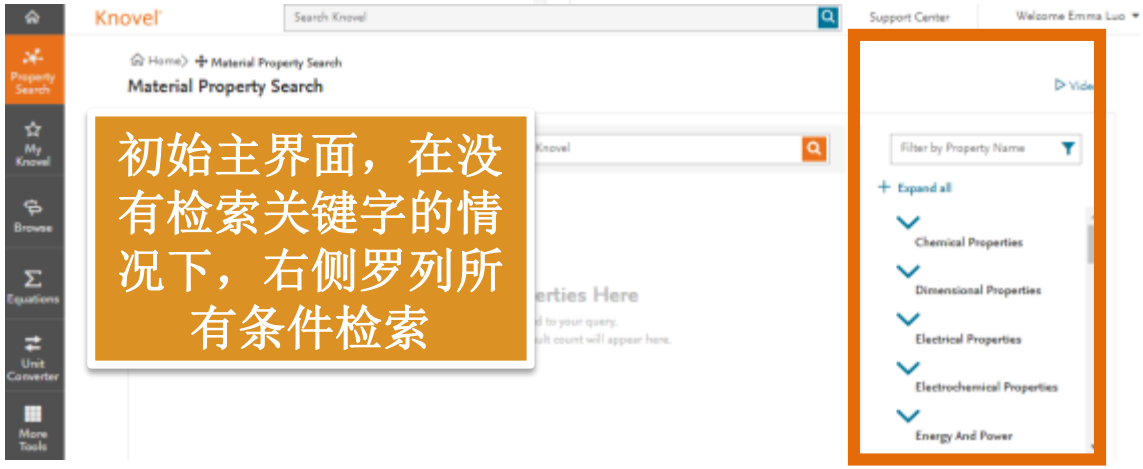
An artificial neural network is a computational model that consists of a network structure, and learning and recall procedures. Tsoukalas and Uhrig (1997) defined an artificial neural network as "a data processing system consisting of a large number of simple, highly interconnected processing elements (artificial neurons) in an architecture inspired by the structure of the cerebral cortex of the brain." These processing elements (or neurons) usually belong to three kinds of layers — an input layer, one or more hidden layers, or an output layer — and are interconnected as a feedforward network structure, in which neurons in a given layer have no lateral connections with each other and no connection back to the previous layers. The connection weights are unknown parameters, which are estimated by a training method. The most popular training method is backpropagation, which repeatedly distributes training errors from output neurons proportionally back to their connection weights until training error reaches a given threshold.

场景二：数值检索 – 数秒定位查询答案（独家）



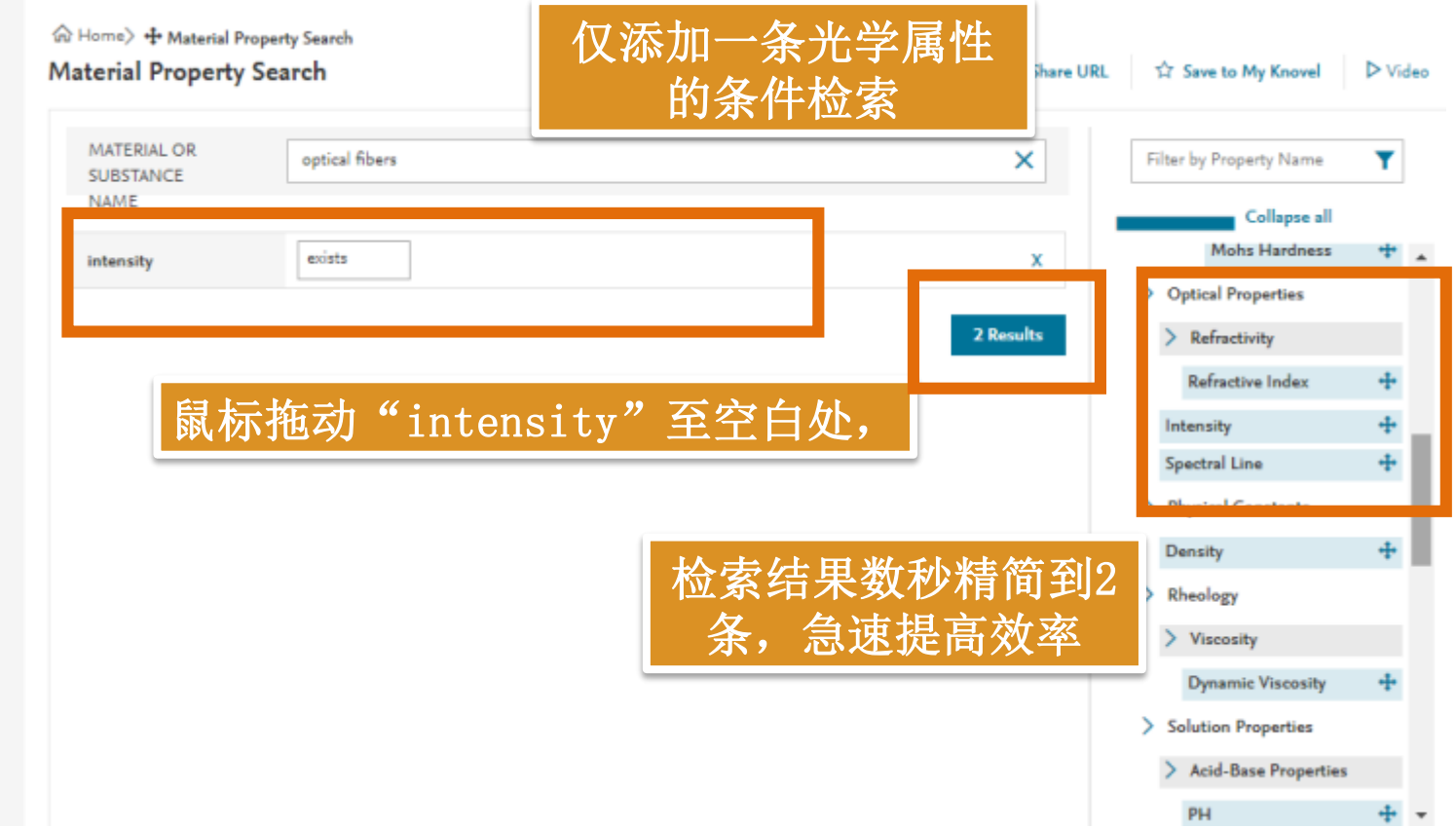
设置通信常用光纤检索

系统自动筛选出符合光纤的条件检索，自动剔除不相关条件



初始主界面，在没有检索关键字的情况下，右侧罗列所有条件检索

数值检索



仅添加一条光学属性的条件检索

鼠标拖动“intensity”至空白处，

检索结果数秒精简到2条，急速提高效率

互动表格

Page 1 of 3 Rows 1 - 50 of 13

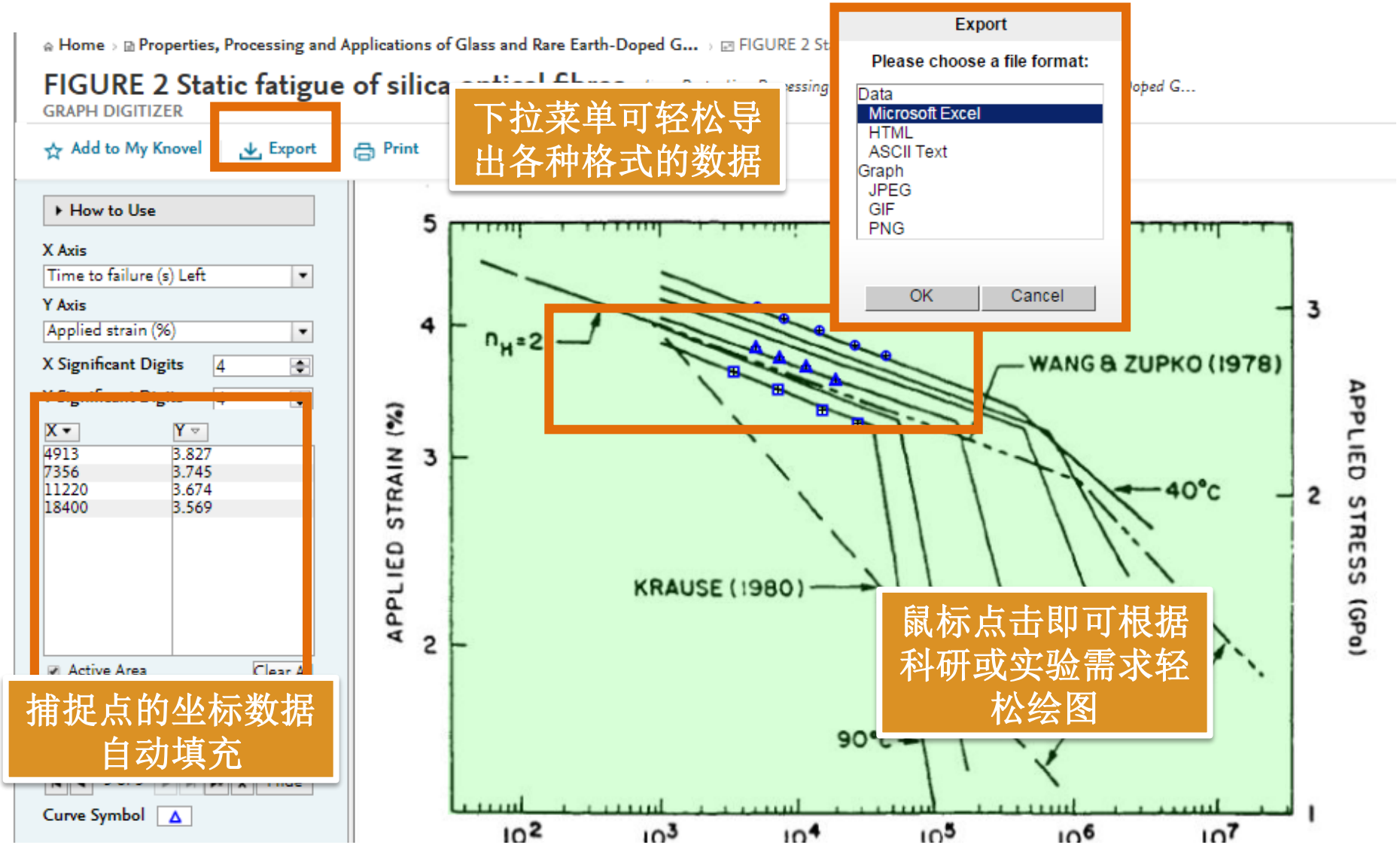
x-axis label	y-axis label	graph title	text	graph digitizer
Wave number, ν (cm^{-1})	Loss α (dB/km) bottom	FIGURE 1 Absorption spectra of silica glass. Dotted curves: model absorption spectra calculated to reproduce the measured refractive index curve; solid curves: measured absorption spectra; broken line: Rayleigh scattering and loss spectrum of a low loss pure silica core single-mode fibre.	view text	
Energy, E (eV)	Loss α (dB/km) top	FIGURE 1 Absorption spectra of silica glass. Dotted curves: model absorption spectra calculated to reproduce the measured refractive index curve; solid curves: measured absorption spectra; broken line: Rayleigh scattering and loss spectrum of a low loss pure silica core single-mode fibre.	view text	
Wavelength (μm)		FIGURE 1 Dispersion behaviour of silica at room temperature from 0.[illegible] to 2.3 μm.	view text	
		FIGURE 1 Temperature dependence of viscosity for silica glasses		

光纤相关属性数值

随时查看全文

点击互动图表

互动绘图


Home › Properties, Processing and Applications of Glass and Rare Earth-Doped G... › FIGURE 2 St
FIGURE 2 Static fatigue of silica
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Microsoft Excel
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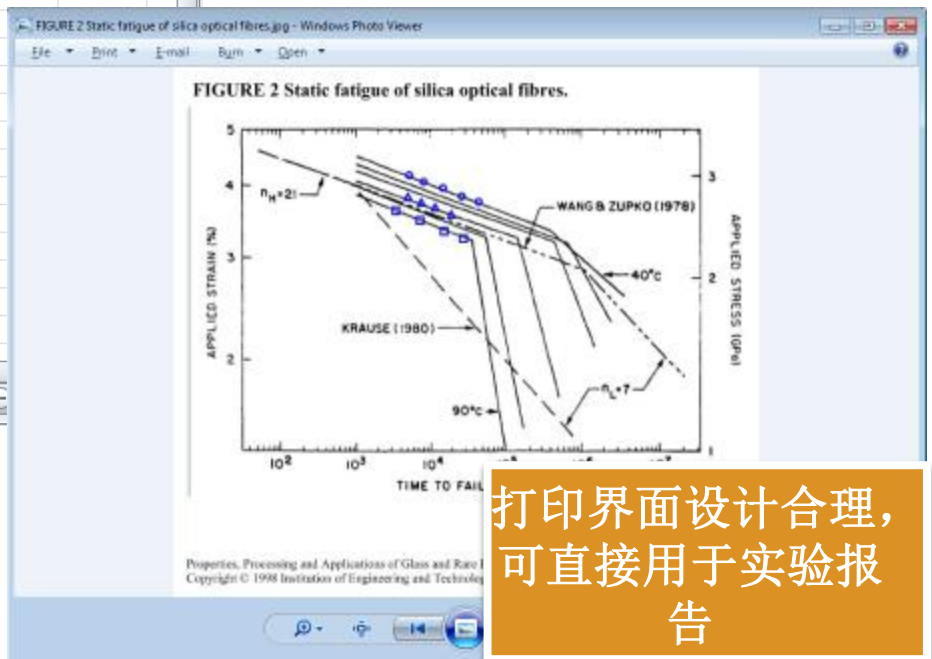
Graph
JPEG
GIF
PNG
OK
Cancel
How to Use
X Axis
Time to failure (s) Left
Y Axis
Applied strain (%)
X Significant Digits
4
X
Y
4913
3.827
7356
3.745
11220
3.674
18400
3.569
Active Area
捕捉点的坐标数据自动填充
Curve Symbol
APPLIED STRAIN (%)
APPLIED STRESS (GPa)
n_H=2
WANG & ZUPKO (1978)
40°C
KRAUSE (1980)
90°C
鼠标点击即可根据科研或实验需求轻松绘图

结果输出

FIGURE 2 Static fatigue of silica optical fibres.xlsx - Microsoft Excel

	A	B
1	FIGURE 2 Static fatigue of silica optical fibres.	
2		
3	Curve 1	
4	Time to failure (s) Left	Applied strain (%)
5	5097	4.172
6	7916	4.064
7	14240	3.967
8	25140	3.836
9	42010	3.754
10		
11		
12	Curve 2	
13	Time to failure (s) Left	Applied strain (%)
14	3405	3.621
15	7091	3.485
16	14770	3.337
17	26560	3.242
18		
19		
20	Curve 3	
21	Time to failure (s) Left	Applied strain (%)
22	4913	3.827
23	7356	3.745

结果导出Excel表格，可以分享或直接用于论文，文献自动生成 – 方便快捷



打印界面设计合理，可直接用于实验报告

场景三：互动方程式（工程计算可以如此简单）

Kn Engineering Technical Re × Kn Interactive Equations - Kn ×

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应用 ★ Bookmarks Import Contacts and CC MBS MBA 幼升小 其他书签

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  - Power Generation (50)
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- General Engineering & Pr... (100)
- IChemE Equations (341)
- Mechanics & Mechanical ... (1001)
- Metals & Metallurgy (20)
- Oil & Gas Engineering (77)

Electrical & Power Engineering

Covers power generation, plant design, energy storage including batteries, transmission line design and operation, electrical safety, and energy efficiency. Of use to electrical, power, mechanical, and civil engineers designing turbines, power generation plants, transmission towers and cabling, installing pipelines for underground transmission, and electrical safety devices.

Boiling Point of Water at Certain Altitudes

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The factor that gives rise to variation of the boiling point of water is the pressure. The barometric formula is used to define the air pressure as a function of altitude. The function wspTSP defined in the collapsible area below calculates the saturation temperature of water/steam as a function of pressure as specified for Region 4 of the Revised Release of the IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and/or Steam.

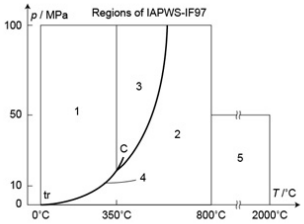
Density of Steam (Region 2 of a Function of Pressure and Sp

The function wspD2PS define as a function of pressure and Release of the IAPWS Industri Water and/or Steam. The equ specific entropy for subregion form.

Density of Steam (Region 2 of a Function of Pressure and Te

Density of Steam (Region 2 of the IAPWS-IF97 Formulation) as a Function of Pressure and Specific Entropy

The function wspD2PS defined in the collapsible area below calculates the density of steam as a function of pressure and specific entropy as specified for Region 2 of the Revised Release of the IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and/or Steam. The equations for steam temperature as a function of pressure and specific entropy for subregions of Region 2 of the IAPWS-IF97 is shown in the dimensionless form.



Equation Open Equation Solver

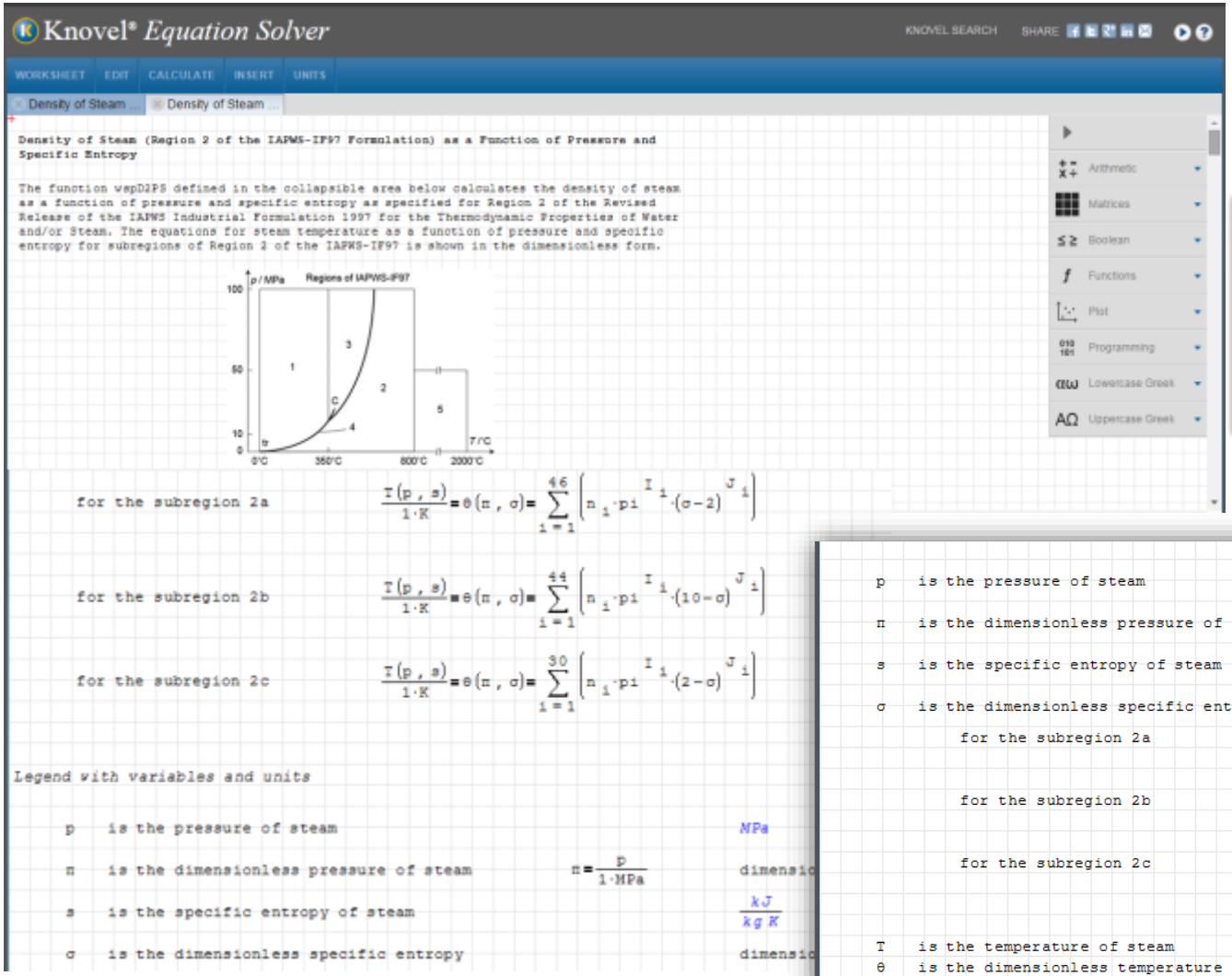
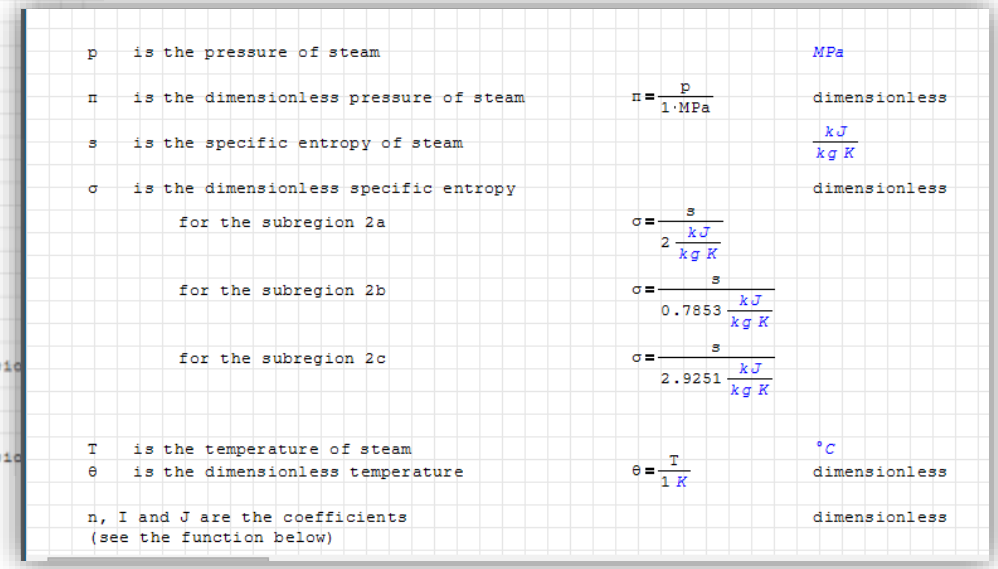
$$\frac{T(p,s)}{1\cdot K}=\theta(\pi,\sigma)=\sum_{i=1}^{46}\left(n_i\cdot pi^{I_i}\cdot(\sigma-2)^{J_i}\right)$$

$$\frac{T(p,s)}{1\cdot K}=\theta(\pi,\sigma)=\sum_{i=1}^{44}\left(n_i\cdot pi^{I_i}\cdot(10-\sigma)^{J_i}\right)$$

$$\frac{T(p,s)}{1\cdot K}=\theta(\pi,\sigma)=\sum_{i=1}^{30}\left(n_i\cdot pi^{I_i}\cdot(2-\sigma)^{J_i}\right)$$

ρ is Density of steam, kg/m^3
R is specific gas constant, kJ/kgK
p is pressure of steam, MPa
π is pressure of steam, dimensionless
s is specific entropy of steam, kJ/kgK
σ is specific entropy of steam, dimensionless
T is temperature of steam, °C
θ is temperature of steam, dimensionless

云计算的互动方程式



直接填数计算或编辑公式，让方程式成为工程师们日常必不可缺的工具