Hekmat Kawas

647-524-2075 | kawas.hekmat@gmail.com | linkedin.com/in/hekmat-kawas/ | HekmatK.com

EDUCATION

Bachelor of Chemical Engineering   Graduating Dec, 2026
Toronto Metropolitan University   *Toronto, ON*

Relevant Course Work: AI in Chem Eng, Industrial Mixing & Pharmaceutical Processing, Process Dynamics & Control, Chemical Process Safety, Polymer Science Engineering, Chemical Reaction Engineering, Plastic Technology, Particulate Eng

EXPERIENCE

R&D Lab Technician - *Protech Group*   Jan 2025 – Aug 2025

- **Prepared and validated 75+ powder coating formulations** using mixing, extrusion, and grinding equipment for automotive and industrial applications, used to generate **70 tons annually** resulting in **$725K+** in reoccurring **revenue**
- Conducted error analysis using lab instrumentation and solved 5+ contamination cases, **improving batch pass rates by 20%** and freeing lab capacity to execute additional formulations **contributing to $15K+ in profit**
- Led the digitization of manual batch records and lab documentation for 200+ formulations, **increasing operational efficiency** and **reducing downtime** by **7% ($10.5K+ annual savings)**
- Analyzed batch data in Excel to compare trial performance across variables such as resin ratio, cure time, and pigment load, helping refine formulation parameters **increasing productivity by 30% by saving 5 hours per formulation**
- **Identified root causes of sample failures related to dispersion quality and formulation balance**, implementing targeted adjustments that **enabled successful client evaluation samples**
- Operated within a safety-critical chemical laboratory, **maintaining compliance with WHMIS, SDS-guided chemical handling, and hazardous waste protocols,** contributing to zero findings during internal safety audits

Manager - *Fossil*   Nov 2021 – July 2024

- Managed day-to-day operations of a **multi-employee, high-volume system**, coordinating resources and personnel to meet performance targets under constrained conditions
- Applied **continuous improvement principles** to team workflows, **improving efficiency, task allocation, and throughput**
- Demonstrated leadership in a **time-critical environment**, making decisions to balance service quality, safety, and productivity

PROJECTS

Lithium Recycling Plant Design

- Designed a scalable process plant that recovers lithium from used lithium-ion batteries using **hydrometallurgical techniques** able to process up to **1000 tons of batteries annually**
- Created **process flow diagrams,** and performed **mass and energy balances** to make decisions regarding **equipment sizing, utility requirements, and process integration decisions**
- Selected and sized unit operations optimizing for the most efficient **throughput, residence time, and recovery constraints**

Liquid-Liquid Blending Unit Design

- Engineered a stirred-tank blending system for miscible liquids, **optimized through impeller design and tank geometry**
- Modeled equipment in **SolidWorks** and evaluated mixing geometry to support uniform concentration at steady state
- Evaluated and selected process control strategies for optimal concentration consistency and minimal composition variability

Process Equipment Sizing Program

- **Developed a Python-based process equipment sizing application** integrating fluid mechanics and reaction engineering to evaluate pump performance, pipe hydraulics, and reactor sizing under user-defined conditions
- Implemented core chemical engineering design correlations, including flow regime analysis, friction factor correlations, and total dynamic head calculations within an interactive user interface
- Developed preliminary equipment sizing and performance estimates used to support preliminary process design, equipment selection, and early-phase feasibility assessment

TECHNICAL SKILLS

- **Software:** Aspen Plus, Aspen HYSYS, SolidWorks, Excel & MS tools
- **Lab & Process Skills:** Chemical handling, troubleshooting, technical reporting, lab-scale and pilot-scale equipment
- **Programming Languages:** MATLAB, Java, Python