ATJ – Alcohol to Jet from Isobutanol

4th International Conference on Biofuels Standards

November 14th, 2012

Forward-Looking Statements

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For a further discussion of risks and uncertainties that could cause actual results to differ from those expressed in these forward-looking statements, as well as risks relating to the business of Gevo in general, see the risk disclosures in the Annual Report on Form 10-K of Gevo for the year ended December 31, 2011, as amended, and in subsequent reports on Forms 10-Q and 8-K and other filings made with the SEC by Gevo.

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Company Process

Feedstock

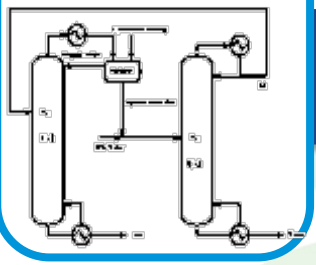
Proprietary Technology

Bio-Cracker

GIFT® Separator

Direct "drop-in"

Green Processing



Target Markets

ATJ – Alcohol to Jet

Gevo ATJ Utilizes Proven Commercial Processes

Synthetic FT Jet Fuel

Gasification → Olefins → Kerosene Jet Blendstock

ASTM Specification and in commercial use.

Synthetic HEFA Jet Fuel

Triglycerides → Olefins → Kerosene Jet Blendstock

ASTM Specification and in commercial use

Synthetic Alcohol-to-Jet (ATJ)

Alcohols → Olefins → Kerosene Jet Blendstock

- Fermentation

ASTM in process, Gevo targeting approval in 2013.

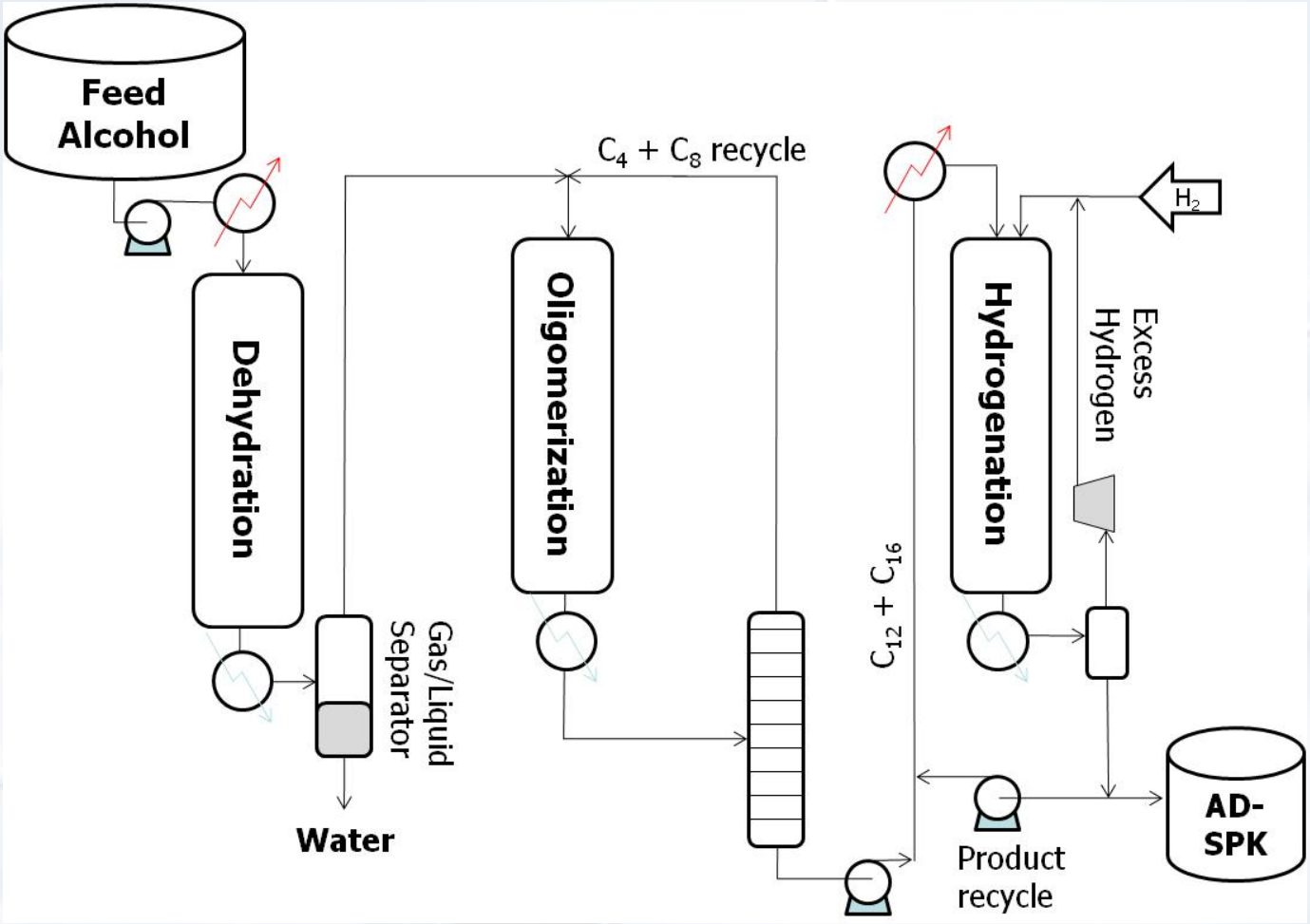
Proven Demo Scale ATJ Production

Synthetic Alcohol-to-Jet (ATJ)

• Fermentation

→ Alcohols → Olefins → Kerosene Jet Blendstock

Simplified Process Flow Diagram



ATJ & ASTM

ASTM History

- ASTM Task Force in ASTM D02-J6 Initiated by Gevo® (June 2010)
- Group of producers assembled (Fall 2010)
- First task force meeting with engine OEMs at (Dec 2010 ASTM)
- Task Force meetings held at both 2011 ASTM and CAAFI meetings
- Task Force focused in two main areas:
  - ATJ-SPK (paraffins)
  - ATK-SKA (w/aromatics)
- ASTM Members in 2012 building assets and tolling capacity.

Overview of Alcohol-to-Jet Companies

Alcohol:

Single	**Mixed**
Gevo® (*i*-C_4)	Logos
Cobalt (*n*-C_4)	ZeaChem
Byogy (EtOH)	
Lanzatech/Swedish (EtOH)	

Dehydration
Oligomerization
Hydrogenation

Alcohol-derived SPK
Gevo®
Cobalt
ZeaChem

Both Options
Lanzatech
Swedish

Dehydration
Oligomerization
Hydrogenation
Aromatization, etc.

SPK w/aromatics
Byogy
Logos

Route Forward

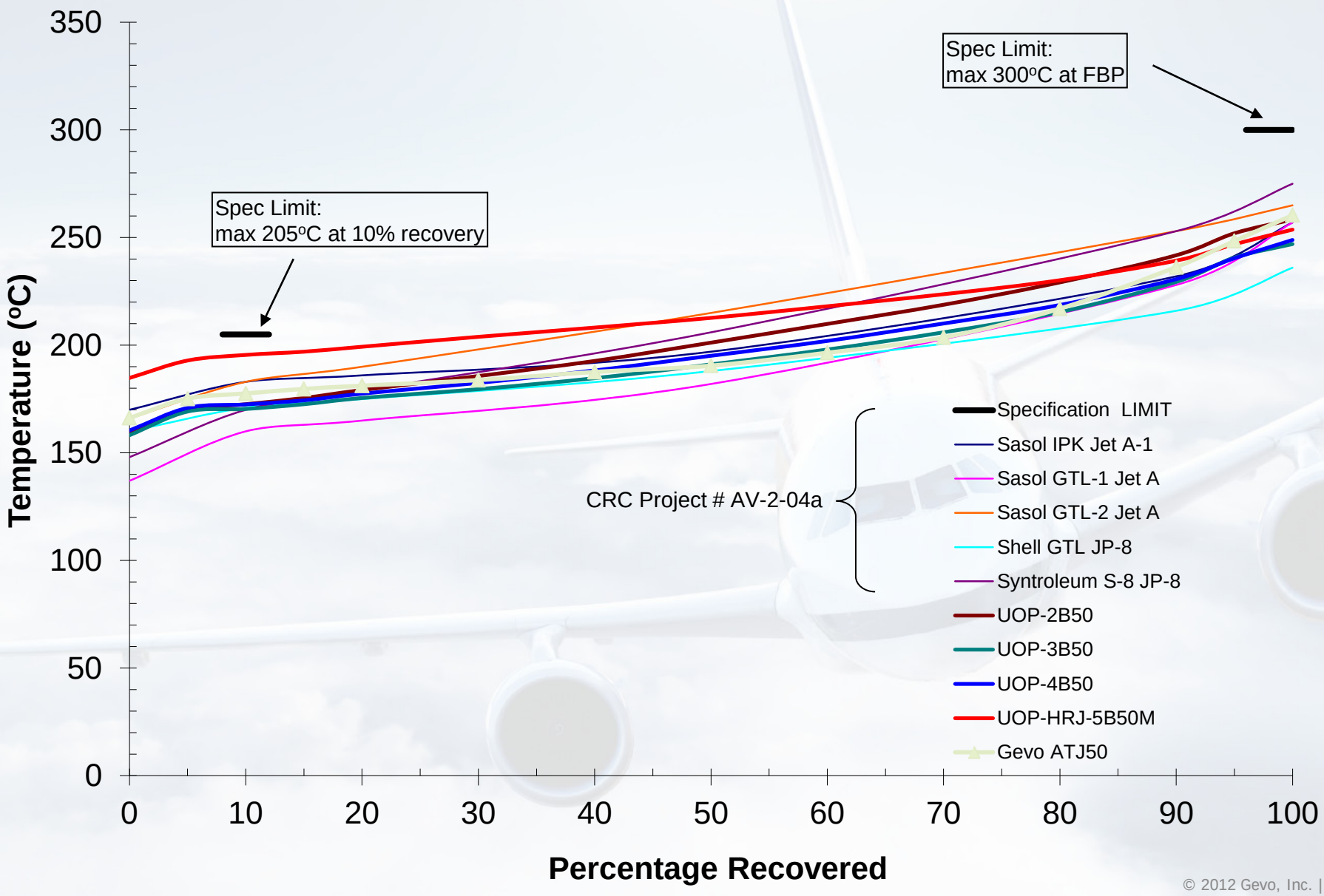
- Following members have/working on Fit-for-Purpose testing
  - Gevo
  - Navy/Cobalt
  - Swedish/Lanzatech
  - Logos
  - Byogy
- Engine testing being completed on ATJ (Gevo)
  - US Air Force
  - Honeywell
  - Pratt & Whitney
  - Rolls Royce
- Currently creating ASTM research report
  - Goal produce draft to OEMs by fall 2012
  - Goal submit for ballot spring 2013 ASTM

ATJ Data

ATJ Fuel Property Data

Jet Fuel Tests	Units	Specification ASTM D1655/7566	Gevo® AD-SPK
Freezing Point	°C	< - 40	< -78
Flash Point	°C	> 38	45-50
Distillation (D86) T90 – T10	°C	> 22	25-70
Energy Density	MJ/kg	> 42.8	44.0
Density @ 15°C	kg/L	0.73-0.77 (SPK)	0.76
Aromatics	%	< 0.5	0
Sulfur	%	< 0.0015	0
JFTOT Breakpoint	°C	> 325	> 350

Blend Distillation



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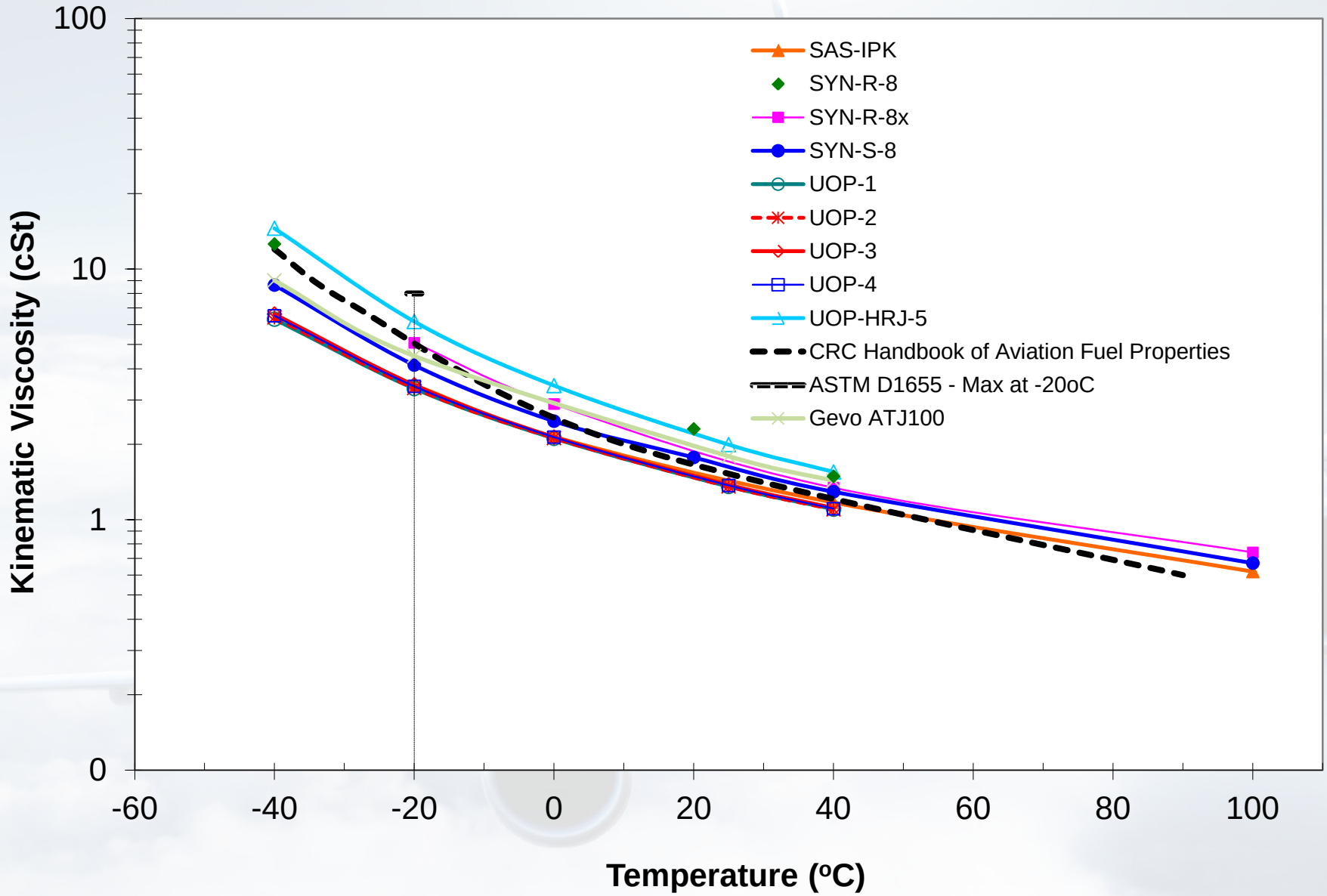
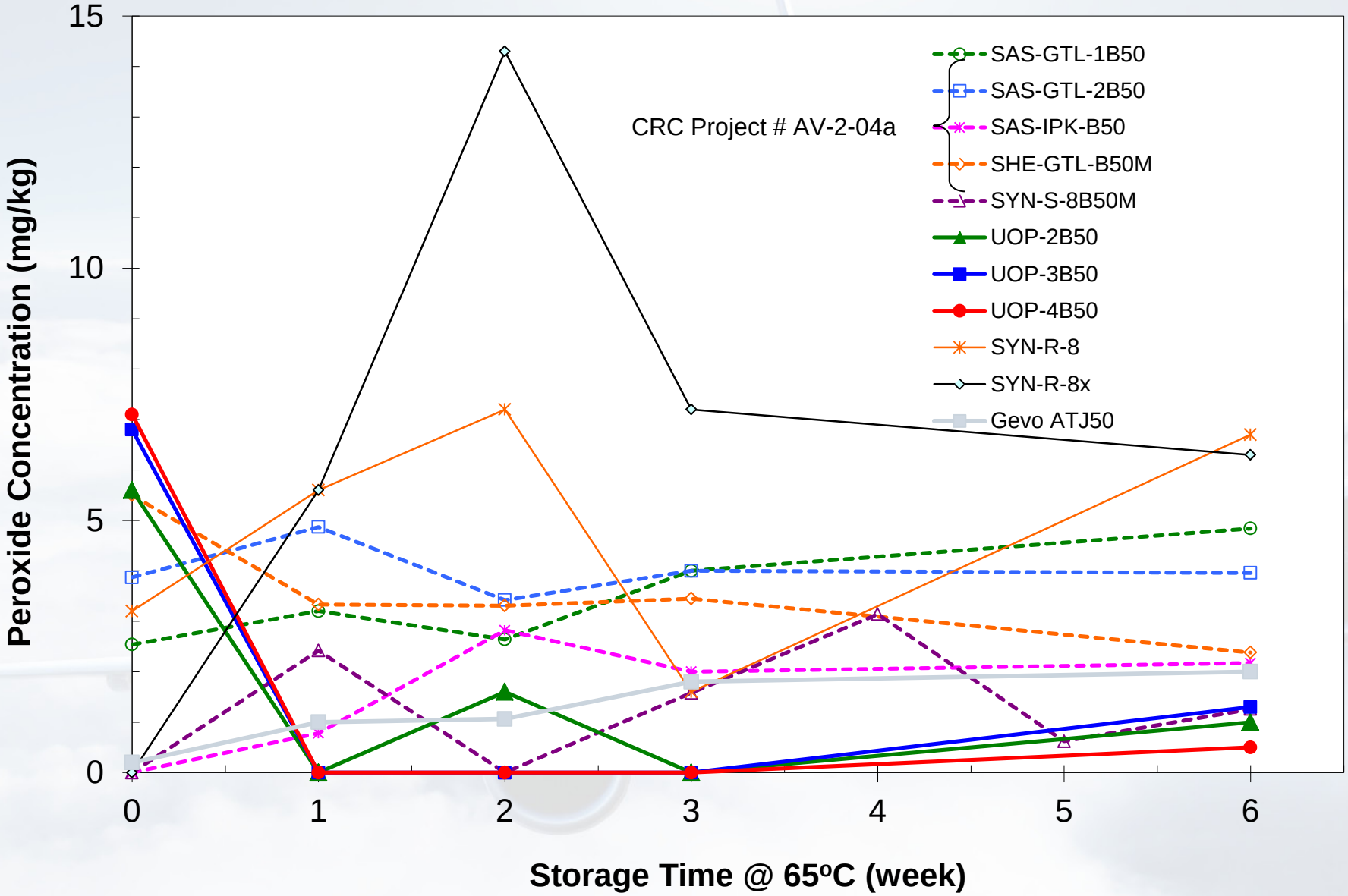
Kinematic Viscosity



Peroxide Formation



Gevo ATJ Fuel Makes History in USAF Flight

"It flew like a usual A-10 without any issues."

Maj. Olivia Elliott, A-10 pilot

"You won't be able to determine the difference and you won't care, because all perform as JP-8."

Jeff Braun

Chief for the Air Force Alternative Fuel Certification Division

ATJ-A10-Video

Thank you for your time and attention

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