

Technical Product Data Sheet											
Tech. Sheet #	005	Version	1.4	Created:	September 20 <sup>th</sup> 2016	by	P. Cáceres	Last updated	March 05 <sup>th</sup> 2019	by	P. Cáceres
Product Name	Laccase (LAC)		Product Code	enz_lac_005		Current Phase	Finished				
Core information											
Product Type	Lyophilized Enzyme	Producing microorganism	<i>Escherichia coli</i> (recombinant)		Microorg. code	BL21	Origin	Thermophilic Bacteria			
EC Number	1.10.3.2			CAS-No.	80498-15-3						
Product Description	Laccase is a copper-containing oxidase that catalyzes the oxidation of different organic and inorganic compounds.										
Temp Range °C	30-90°C	Opt. temp °C	80°C	Thermo stability	Maintains at least 60% of its activity after 2 hours of exposure at 60°C.	pH range	5.5-7.5	Opt. pH	6.0		
Substrate	Syringaldazine and O <sub>2</sub>										
Products	Oxidized Syringaldazine and H <sub>2</sub> O										
Reaction	Syringaldazine + O <sub>2</sub> → Oxidized Syringaldazine + 2 H <sub>2</sub> O										
U (Unit definition)	One unit (U) of laccase activity was defined as a change in absorbance of 0.001 measured 530 nm per minute, at 70°C and pH 6.0 using syringaldazine as substrate										
Specific Activity	≥ 300,000 U/mg										
Protein concentration	≥ 15% (w/w)										
Molecular mass	≈ 59 kDa			Number of subunits	1						
Substrate chirality	No										
Product chirality	No										
Alternative substrates tested	Gallic acid										
Form	Lyophilized powder										
Other components	0.05M Tris HCl pH 8.0 and 0.85 M NaCl (before lyophilizing)										
Stability	At -20°C, it maintains the reported activity (≥ 300,000 U/mg) at least for 11 months. (Preliminary Data)										
Storage temperature	-20° C										
Shipping conditions	Inside a Styrofoam-box with ice-packs										

pH dependence

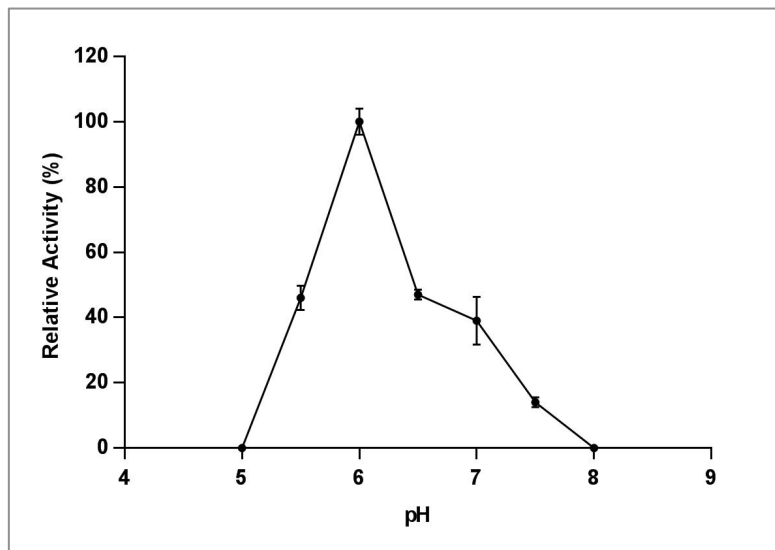


Fig 1. pH dependence of recombinant LAC. Activity was measured by monitoring pH from 5.0 to 8.0 at 70°C.

Temperature dependence

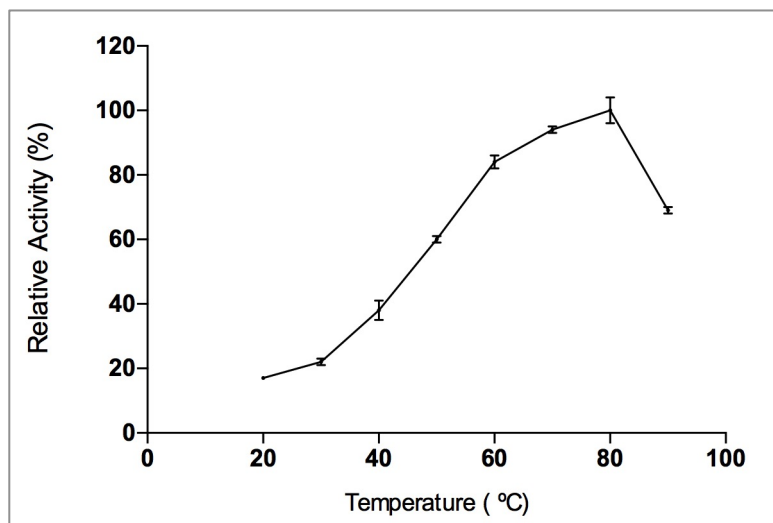
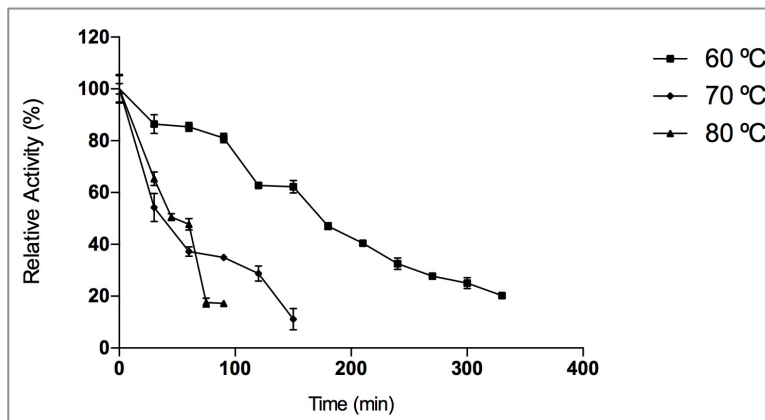


Fig 2. Temperature dependence of recombinant LAC. Activity was measured by monitoring temperature from 30 to 100° C using 100 mM Phosphate buffer (pH 6.0).

**Thermo-stability**



**Fig 3.** Thermostability of the recombinant LAC. activity was measured by monitoring at three different temperatures (60°C, 70°C and 80°C) using 100 mM Phosphate buffer (pH 6.0).

**Note:** When using 200 mM sodium acetate pH 6.0, SWA Laccase maintains: ~75% of its activity after 6 hours of exposure at 60°C, at least 60% of its activity after 2 hours of exposure at 70°C and at least 60% of its activity after 30 minutes of exposure at 80°C.

**Scientific and Technical References**

1. Piscitelli A, Pezzella C, Giardina P, Faraco V, Sannia G. (2010). Heterologous laccase production and its role in industrial applications. *Bioengineered bugs*.1(4):254-64.
2. Santhanam N, Vivanco JM, Decker SR, Reardon KF. (2011). Expression of industrially relevant laccases: prokaryotic style. *Trends in biotechnology*. 29(10):480-9.
3. Sharma P, Goel R, Capalash N. (2007). Bacterial laccases. *World Journal of Microbiology and Biotechnology*. 23(6):823-32.
4. Sigma Aldrich: <http://www.sigmaaldrich.com/technical-documents/protocols/biology/enzymatic-assay-of-laccase.html>

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